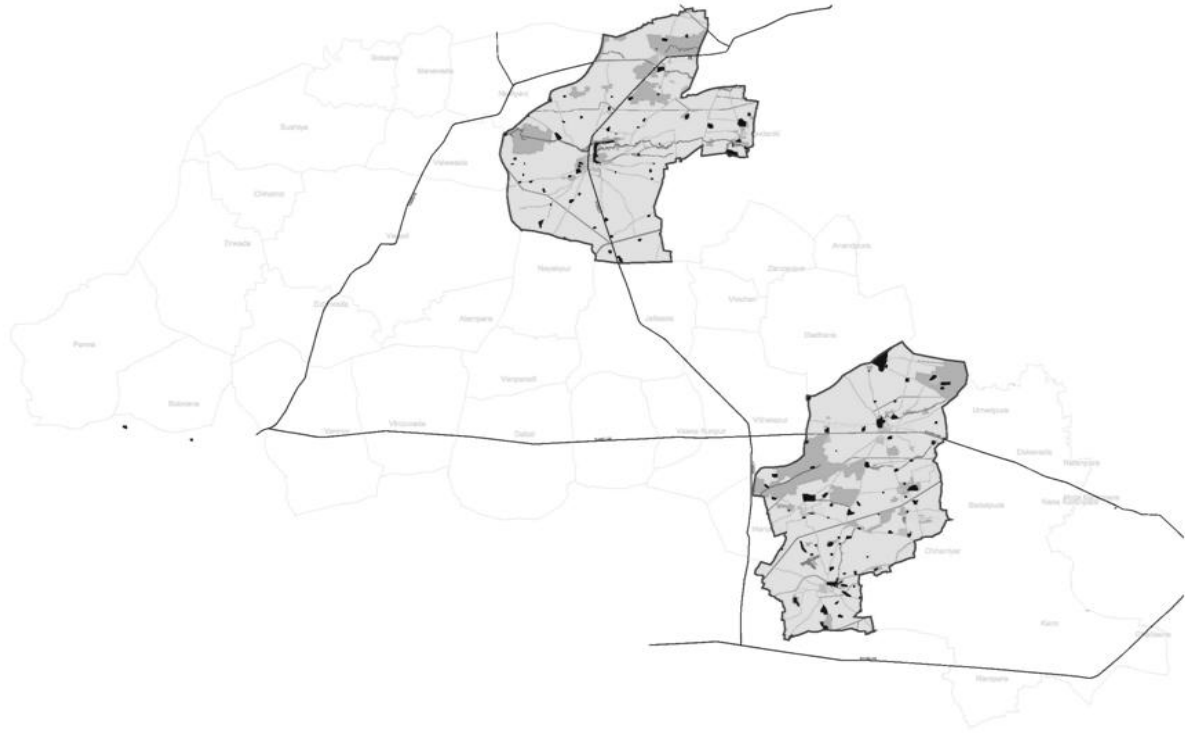


Mandal Becharaji Special Investment Region (MBSIR)

Report 1 - Draft Development Plan Report



**DRAFT DEVELOPMENT PLAN SUBMITTED U/S 15 (3)(ii) AND 17 OF
THE GSIR ACT 2009 AND U/S 16 OF THE GTP & UD ACT 1976**

**Mandal Becharaji Special Investment Regional
Development Authority, Gandhinagar**

C/O: DSIRDA, Block No. 11/12, 3rd Floor, Udyog Bhavan, Sector 11, Gandhinagar - 382017

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(MBSIR)**

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Abbreviation

DFC	Dedicated Freight Corridor
DMIC	Delhi-Mumbai Industrial Corridor
SIR	Special Investment Region
MBSIR	Mandal Becharaji Special Investment Region
MBSIRDA	Mandal Becharaji Special Investment Regional Development Authority
DP	Development Plan
GDCR	General Development Control Regulations

Acts

GTP & UD	Gujarat Town Planning & Urban Development
GSIR	Gujarat Special Investment Region

State and Central Government Organisations

CPHEEO	Central Public Health and Environmental Engineering Organisation
CPCB	Central Pollution Control Board
GETCO	Gujarat Energy Transmission Company
GIDB	Gujarat Infrastructure Development Board
GPCB	Gujarat Pollution Control Board
SSNNL	Sardar Sarovar Narmada Nigam Limited
DILR	District Inspector of Land Records
GSRDC	Gujarat State Road Development Corporation
MoEF	Ministry of Environment and Forests
PCCF	Principal Chief Conservator of Forest
GWSSB	Gujarat Water Supply and Sanitation Board
GWIL	Gujarat Water Infrastructure Limited

Utility Infrastructure Terms

CETP	Common Effluent Treatment Plant
DCS	Distribution Control System
STP	Sewage Treatment Plant
SWM	Solid Waste Management
TSE	Treated Sewage Effluent

Financial and Economic Terms

CAPEX	Capital Expenditure
ERR	Economic Rate of Return
ENPV	Economic Net Present Value
OPEX	Operating Expenditure

Terms Related to Transportation

NH	National Highway
SH	State Highway
MDR	Major District Road
ODR	Other District Road
TOD	Transit Oriented Development
PCU	Passenger Car Equivalent
ROW	Right of Way

CHAPTER 1

INTRODUCTION

1. Introduction

1.1. Overview

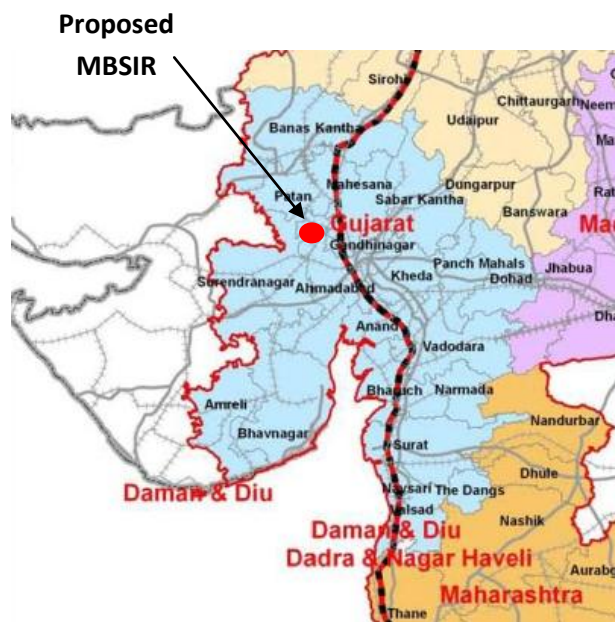
Spread over more than 102 Sq.km, Mandal Becharaji Special Investment Region (MBSIR) is a new industrial hub being planned about 90km from Ahmedabad and 85 km from Gandhinagar near Becharaji town. Envisaged by the government of Gujarat, MBSIR is one of its kind industrial hubs and will comprise automobile, manufacturing and auxiliary industries. The SIR is strategically located, well connected with trade gateways and falls in the influence zone of proposed Delhi – Mumbai Industrial Corridor project (DMIC), a joint initiative by the Government of India and Japan.

The dedicated freight corridor (DFC) passes through six different states. Distribution of its length in these states is mentioned below

- Delhi NCR – 1.5%
- Haryana – 10%
- Uttar Pradesh – 1.5%
- Rajasthan – 39%
- **Gujarat – 38%**
- Maharashtra – 10%



1-1, DMIC influential area, India



1-2, DMIC influential area, Gujarat

Govt. of Gujarat has been pro active to take advantage of proposed DMIC Project. It has declared around 10 Special Investment Regions in the area of influence of DMIC. For Mandal Becharaji Special Investment Region, a concept plan has been prepared which consist of

- Delineation of SIR region
- Basic physiographic studies of region
- Target sectors for SIR and market analysis

- Conceptual land use and infrastructure proposals
- Block cost estimates

For implementation of concept plan, the state govt. has decided to prepare a development plan for the region. The overall process for preparation of development plan comprises of following stages:

1. Declaration of special investment region u/s 3 read with section 4 of the Gujarat Special Investment Region Act, 2009
2. Establishment of apex authority – The Gujarat Infrastructure Development Board (GIDB), established u/s 17 of Gujarat Infrastructure Development Act, 1999 is declared and designated as the Special Investment Region Apex Authority u/s 5 of GSIR Act, 2009
3. Constitution of a regional development authority as per sub-section (1) of sections 8, 9, 10 and 15 of the Gujarat Special Investment Region Act, 2009
4. Preparation of draft development plan u/s 15 of GSIR Act 2009 and u/s 9 of GTP & UD Act 1976
5. Publication of draft development plan u/s 17 of GSIR Act 2009 and u/s 13 of GTP & UD Act, 1976
6. Receive/consider objections and suggestions u/s 17 of GSIR Act 2009 and u/s 14 of GTP & UD Act, 1976
7. Publication of modifications done in development plan after receiving objections and suggestions, u/s 17 of GSIR Act 2009 and u/s 15 of GTP & UD Act, 1976
8. Submission of draft development plan to State Government for sanction u/s 17 of GSIR Act 2009 and u/s 16 of GTP & UD Act, 1976

This publication addresses stage 7 of the above process and comprises of modified draft development plan after receiving objections and suggestions, u/s 15(3)(ii) u/s 17 of GSIR Act 2009 and u/s 15 of GTP & UD Act 1976.

The publication comprises of two reports. Report 1 covers the proposal on land use, infrastructure, implementation and block cost estimates and Report 2 covers the Draft General Development Control Regulations (DGDCR) for the proposed SIR.

1.2. Notification of Mandal Becharaji Special Investment Region

In exercise of the powers conferred by section 3 read with section 4 of the Gujarat Special Investment Region Act, 2009 (Guj. 2 of 2009), the Industries and Mines Dept. of Government of Gujarat and the Government of Gujarat declared Mandal Becharaji Special Investment Region (MBSIR) vide Notification No. GHU/2012/22/SIR/112012/1276/I on 24th September 2012 published in Government Gazette. Notification comprises 44 villages of district Ahmedababd taluka Mandal and Detroj, District Surendranager taluka dasada-patadi and District Mahesana taluka bechraji.

Vide Notification No. GHU/2013/16/SIR/112012/1276/I on 14th August 2013 published in Government Gazette, Industries and Mines Department, Government of Gujarat, deleted 36 villages from the earlier declared “Mandal Bechraji Special Investment Region”.

As per notification Mandal Becharaji Special Investment Region comprises of 2 villages of Detroj Taluka and 5 villages of Mandal Taluka from Ahmedabad district and 1 village from Becharaji Taluka of Mehsana

District. The total area spread over 8 villages, about 101.72 sq.km. as per notification and as per measured on base map 102.10 sq km.

SR. NO.	NAME OF DISTRICT	NAME OF TALUKA	NAME OF REVENUE VILLAGES			
			Sr. No.	Name of Village	Total nos.	survey
1	2	3	4			
2	Ahmedabad	Mandal	1	Hansalpur Becharaji	Complete	8.63
			2	Sitapur	Complete	36.72
			3	Ughroj	Complete	14.24
			4	Ughroj nu Paru	Complete	6.37
			5	Ukardi	Complete	8.56
		Detroj	6	Bhagapura	Complete	12.43
			7	Shihor	Complete	9.53
3	Mehsana	Becharaji	8	Chandanki	Complete	5.24
Total Area						101.72

Table 1-1, List of notified villages

Source: notification Dated 24th September 2012.

1.3. Constitution of 'Authority' and 'Committee Members' of MBSIRDA

In exercise of the powers conferred by sub-section (1) of sections 8, u/s 9, 10 and 15 of the Gujarat Special Investment Region Act, 2009 (Guj. 2 of 2009), the Industries and Mines Dept. of Gujarat and the Government of Gujarat constituted Mandal Becharaji Special Investment Region Development Authority (MBSIRDA) vide Notification No. GHU/12/23/SIR/112012/1276/I on 1st October 2012, published in Government Gazette. MBSIRDA shall consist of the following members, namely:-

Sr. No.	Member	Designation
1	Principal Secretary Industries and Mines Department	Chairperson
2	Industries Commissioner	Vice Chairperson
3	Chief Executive Officer, Gujarat Infrastructure Development Board	Member ex-officio
4	Collector, Ahmedabad,	Member ex-officio
5	District Development Officer, Ahmedabad	Member
6	Collector, Mehsana,	Member
7	Collector, Surendranagar,	Member
8	Director, School of Planning, Centre of Environmental Planning and Technology (CEPT), Ahmedabad	Member
9	Shri U.S. Mehta (Retired Town Planner)	Member
10	President, Gujarat Chamber of Commerce and Industries	Member
11	Chief Executive Officer, Mandal Becharaji Special Investment Region Development Authority	Member Secretary

Table 1-2, MBSIRDA Board Members

Source: Form notification Dated 1st October 2012.

1.4. Powers and Functions of MBSIRDA

The powers and functions of the Mandal Becharaji Special Investment Regional Development Authority will be according to section 15 of 'The Gujarat Special Investment Region Act, 2009. It is thus listed as below:

- 1) The Regional Development Authority shall secure planned development of the Special Investment Region and shall take steps for its effective regulation and efficient management so as to bring and enhance general welfare, convenience, productivity and excellence.
- 2) Without prejudice to the generality of foregoing provisions, the Regional Development Authority shall undertake the management and planning of land resource and infrastructure of the Special Investment Region (SIR).
- 3) The Regional Development Authority shall, in particular, exercise the following powers and perform the following functions namely:-
 - i. To classify and earmark the area of the Special Investment Region for various purposes and usages including economic activities, amenities and community services as it deems fit;
 - ii. To prepare the Draft Development plan for whole or part of the area of the Special Investment Region;
 - iii. To undertake preparation and executing of town planning scheme for whole or part of the Special Investment Region;
 - iv. To regulate the development of the periphery area of the Special Investment Region,
 - v. To acquire, hold and manage moveable or immoveable property as it may deem necessary subject to general or specific directions of the State Government in this regard;
 - vi. To acquire land in the Special Investment Region, by sale, lease, grant, allocation, donation, Town Planning Scheme, consent agreement or through proceedings under the Land Acquisition Act, 1894 for the purposes of this Act,
 - vii. To sale, lease, transfer or dispose of any land or building belonging to it subject to the regulations made by the Apex Authority;
 - viii. To carry out surveys in the Mandal Becharaji Special Investment Region for the preparation of Draft Development Plans and Town Planning Schemes;
 - ix. To prepare, issue and implement the directions, the standards and the norms for building structures, infrastructure development and other construction activities in the Special Investment Region;
 - x. To enter into contracts, agreements or concession agreement with any person, entity, developer or organization as it may deem necessary for performing its functions;
 - xi. To execute, co-ordinate and supervise works in connection with infrastructure or provision of other services and amenities in the Special Investment Region;
 - xii. To provide for disaster management and mitigation in the Special Investment Region;
 - xiii. To levy and collect such fees, development charges, or user charges as may be ascertained and fixed by the Apex Authority under clause (vii) of sub-section (2) of section 6;
 - xiv. To remove encroachments and constructions not duly authorized or made in violation of the regulations, directions and norms laid down by the Regional Development Authority;

- xv. To make arrangements for observance and promotion of safety, order, health and environmental safeguards within the Special Investment Region;
 - xvi. To guide, assist and co-ordinate with other authorities functioning in the Special Investment Region in matters pertaining to planning and use of land and development of the Special Investment Region;
 - xvii. To control the development activities in accordance with the Development plan and to bring aesthetics, efficiency and economy in the process of development;
 - xviii. To ensure and make provisions for sufficient civic amenities and services including hospitals and medical services, schools, fire services, public parks, markets and shopping places, playgrounds, entertainment areas and disposal of waste and provisions of drainage;
 - xix. To make sustainable arrangements for providing and maintaining the highest standards in civic amenities and services particularly for cleanliness, aesthetics, health and hygiene;
 - xx. To make enquiry, inspection, examination or measurement of any land and building in any part of the Special Investment Region;
 - xxi. To exercise such other powers and discharge such other functions as may be prescribed by the rules or regulations.
- 4) (a) Notwithstanding anything contained in the relevant State Acts, rules or any existing instructions of the State Government, the Regional Development Authority may frame its own General Development Control Regulations (GDCR) and the same shall prevail for developments in the Special Investment Region.
- b) Every person, unit or developer or any other stakeholder in Special Investment Region shall be required to get the plans of the building approved by the Regional Development Authority before commencing any construction and shall obtain the approval of the Regional Development Authority necessary and incidental thereto, after the completion and before the use of such premises.
 - c) For the purpose of this section and with any other requirement for proper planning, management and development of the Special Investment Region, the Regional Development Authority may issue such direction or instruction as it may consider necessary to any person, unit, entity, developer or any other stakeholder in the Special Investment Region and the person, unit, entity, developer or, as the case may be, the stakeholder shall be bound by such directions

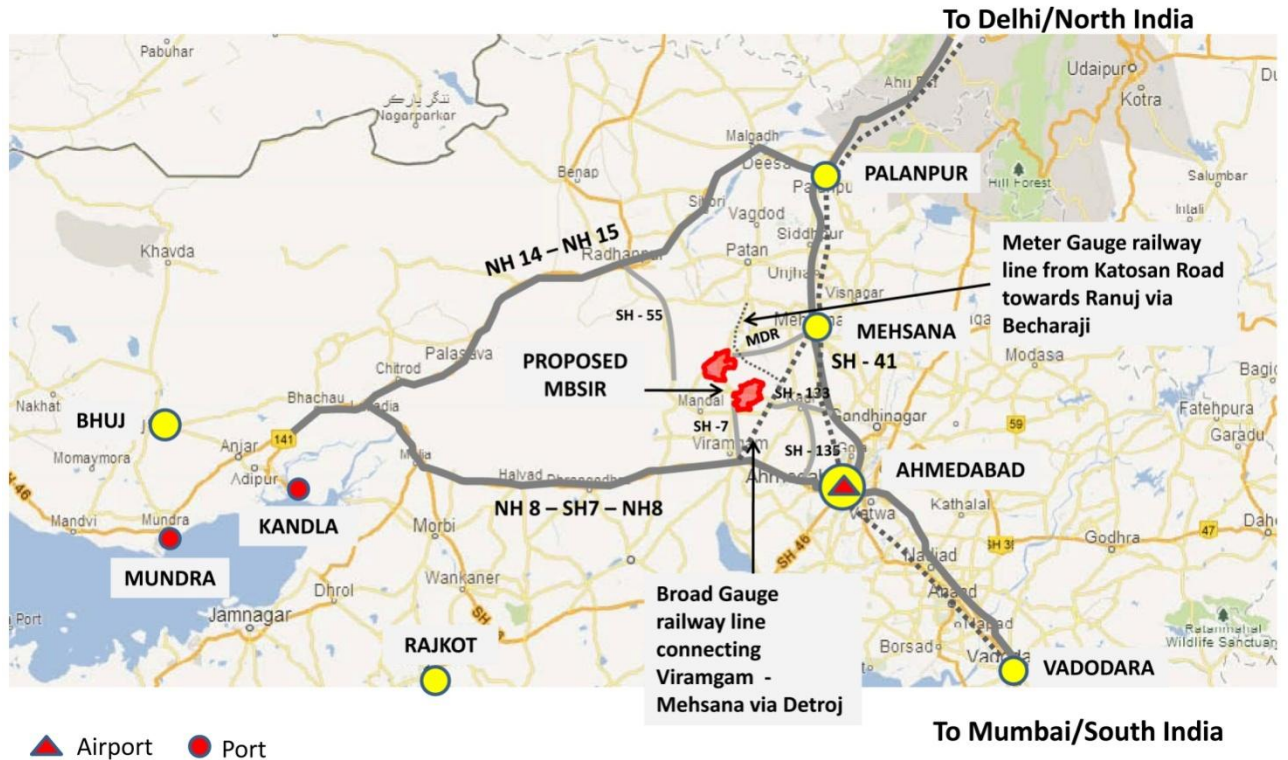
CHAPTER 2

MBSIR - EXISTING SITUATION

2. MBSIR - Existing Situation

2.1. Location & Connectivity

Mandal Becharaji Special Investment Region (MBSIR) is located about 90 km from Ahmedabad and 85 km from Gandhinagar on north-west and near Becharaji town.



2-1, Location & Connectivity - MBSIR

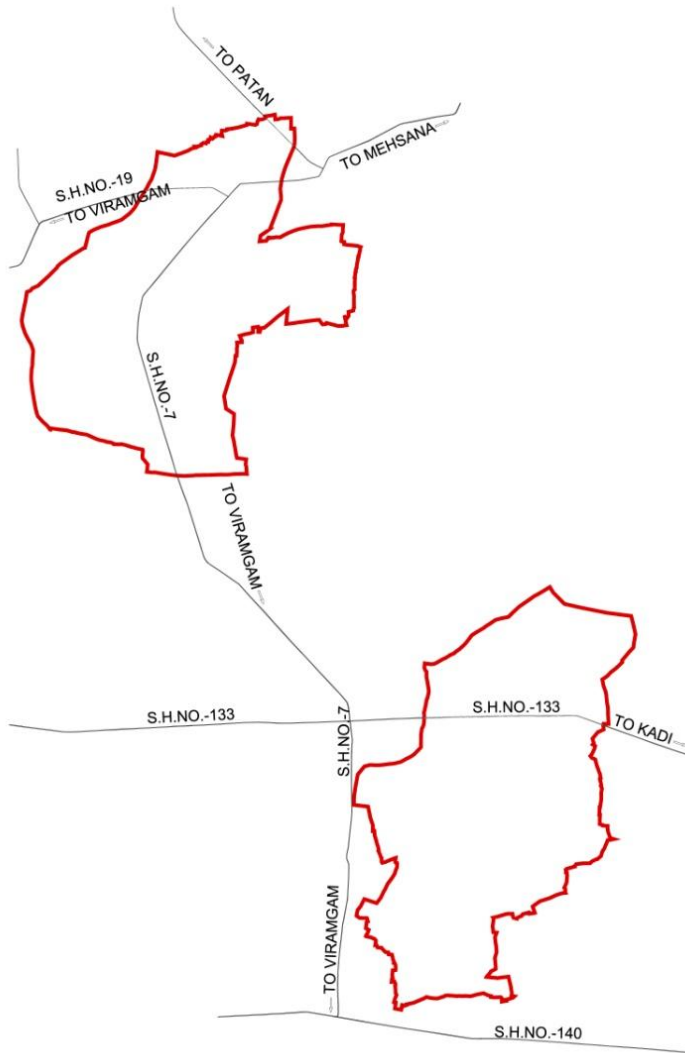
The SIR is regionally well connected through National and State highways as well as railways. National highway 14- 15 connecting Kandla with Palanpur passes through north of the proposed SIR. NH-8 and State highway no. 7 passes from south, and State highway no. 41 connecting Ahmedabad and Mehsana passes along eastern edge of the SIR. The five major roads directly connecting SIR with the National and state highways include:

- SH-133 – Connecting Ahmedabad via Detroj, Kadi, Kalol and Adalaj
- MDR - Connecting Mehsana via Becharaji and Modhera is a 2-lane undivided road
- SH-7- Connecting Viramgam
- SH-135- Connecting Sanand via Kadi and Thol
- SH-55 connecting Mundra via Radhanpur, Harij and Becharaji

A broad gauge railway line connecting Viramgam with Mehsana passes through the SIR at Detroj. Apart from this the SIR is in proximity to a meter gauge line connecting Katosan Road to Ranuj via Becharaji.

2.2. Existing Major Road network

Currently three state highways pass through the proposed SIR. SH 7 connecting Becharaji with Ukardi village. SH 133 providing connectivity between Ughroj and Ughrojpora and SH 19 connecting Hansalpur with Becharaji. These three state highways form a triangular loop within SIR and also provide major entry and exit points.



2-2, Existing Major Road Network within MBSIR

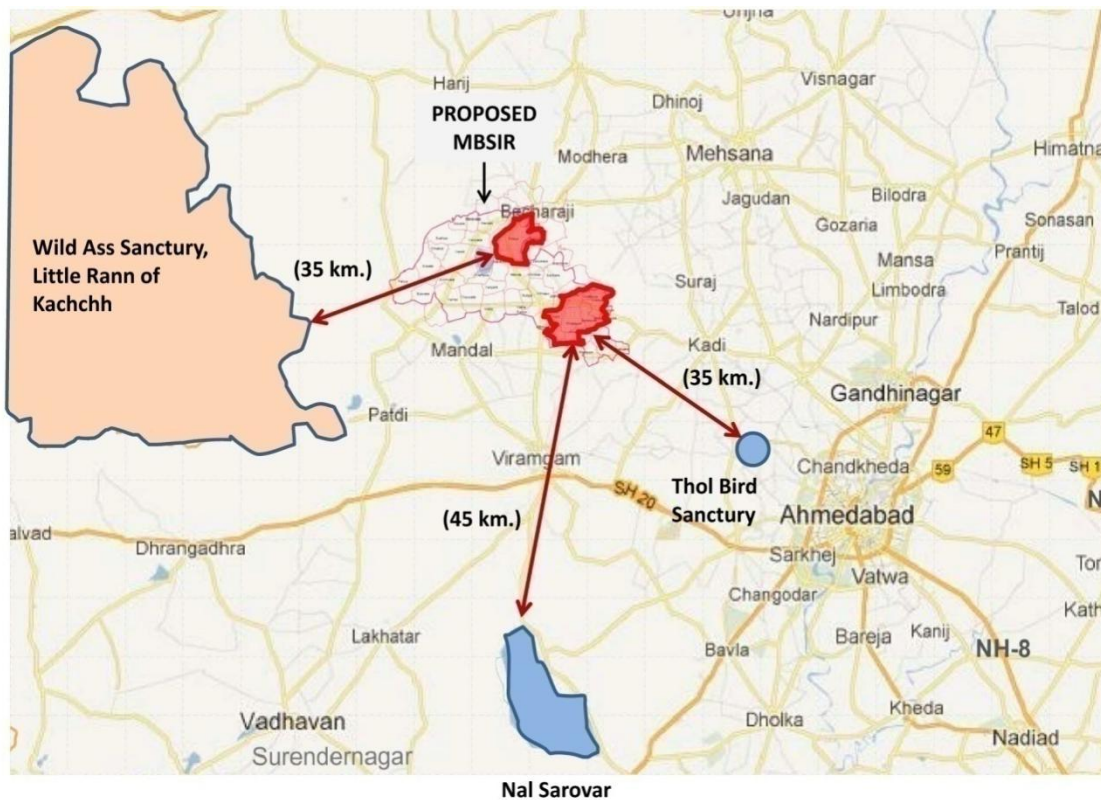


2-3, SH 133 connecting Ughroj with Ughrojpora



2-4, SH 19 connecting Hansalpur with Becharaji

2.3. Location with respect to Environmentally Sensitive Areas

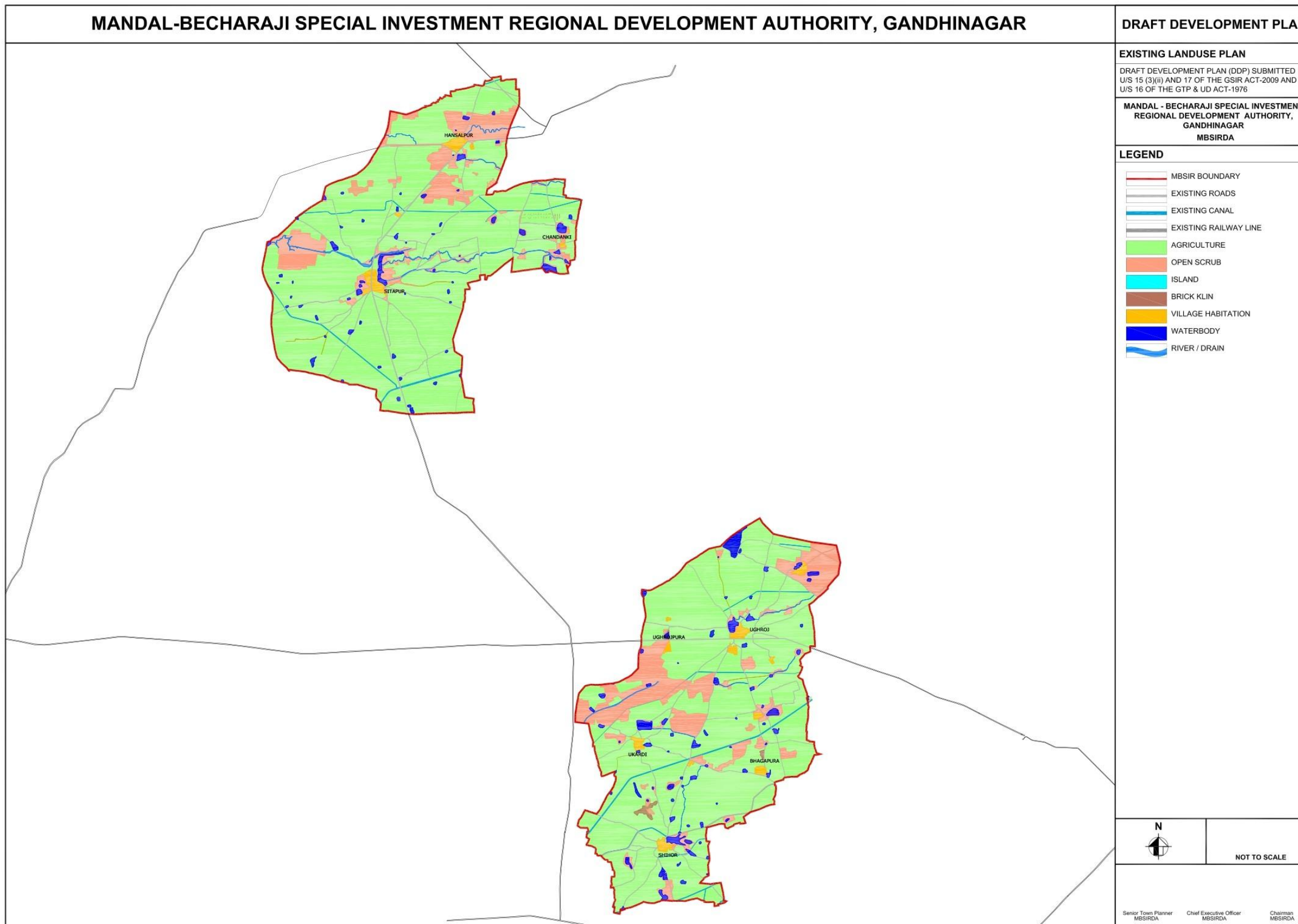


2-5, Location with respect to Environmentally Sensitive areas

There are three notified sanctuaries around proposed SIR, namely Wild Ass sanctuary in Little Rann of Kachchh, Nal sarovar birds sanctuary and Thol lake birds sanctuary. However all of them are more than 10 km. from the notified SIR boundary. The Wild Ass sanctuary in Little Rann of Kachchh is located on east of notified MBSIR region and is around 35 km. away. It spreads over an area of appx. 4900 sq. km. Little Rann of Kachchh is also listed under UNESCO World Heritage Sites. Spread over an area of appx. 120 sq. km., Nal sarovar birds sanctuary is located to the south of SIR and is around 45 km. away. It is a natural lake with shallow waters and muddy lagoons, dotted by 360 islets. Thol bird sanctuary covering an area of around 7 Sq.Km is a manmade lake and is located towards south east of MBSIR around 35 km. away.

2.4. Existing land use

Of the total area only 1.29 % is under Habitation. Around 82.84 sq. km. of land area is under Agriculture land use. Various river tributaries, water tanks and canals account for 3.43 sq. km. (3.36%) of land in MBSIR.



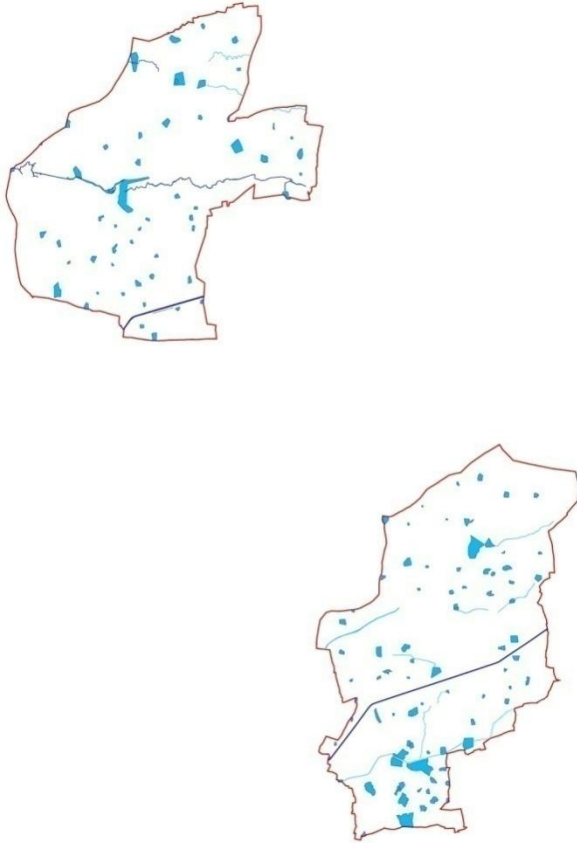
No part of this plan/document may be reproduced without prior permission in writing from MBSIRDA. This plan should not be used for measurements.

2-6, Existing Land Use, MBSIR

Sr. No.	Land Use	Area (Sq. Km.)	%
1	Agriculture	82.84	81.14
2	Habitation	1.32	1.29
3	Brick Kiln	0.14	0.14
4	Open Scrub	13.17	12.91
5	Roads	1.18	1.16
6	Canals	0.83	0.82
7	Water Tanks (Talav)	2.07	2.03
8	River	0.52	0.52
		102.10	100

Table 2-1, Area Statement, Existing Land Use MBSIR

2.5. Rivers, Tributaries, Canal and Water Tanks in the region



2-7, Water bodies in MBSIR

There are four major tributaries and many water tanks in the region covering an area of appx. 3.43 sq.km. (3.36% of total land). One of the major water bodies present in the nearby region is “Saran Lake” near Vanod village. It is a man made water body developed for facilitating irrigation. Its area is appx. 8 sq. km. However it has water only for around six month between August and January. Entire MBSIR area falls within SSNNL command area. There are two branch canals namely Kharaghoda and Zinzuwada which pass through the SIR. Length of these branch canals is around 10 km. Total area occupied by canal network is around 4.5 sq. km.



2-8, Sitapur Lake



2-9, Zinzuwada Branch Canal



2-10, Kharaghoda Branch Canal

2.6. Demography

Demographic profiling of the 8 Villages within SIR is carried out. This includes Population growth, literacy rate, sex ratio, work participation and workers distribution.

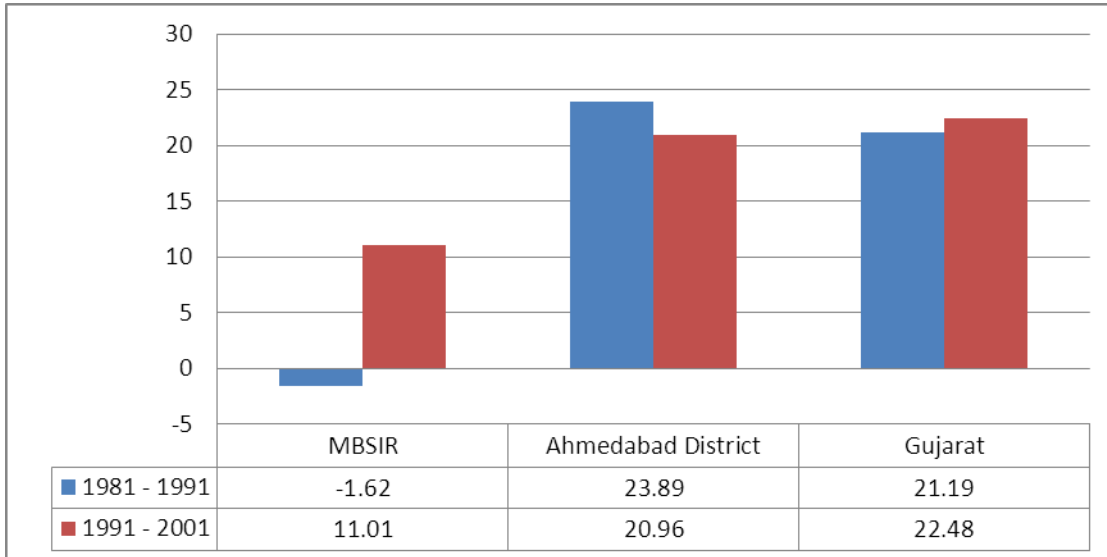
District	Taluka	Village Name	Population			Literacy	Working Population
			Total	Male	Female		
Ahmedabad	Detroj	Bhagapura	1052	531	521	627	389
		Shihor	1384	705	679	775	519
	Mandal	Hansalpur Becharaji	1464	761	703	630	799
		Sitapur	4161	2210	1951	2273	2166
		Ughroj	1686	883	803	659	458
		Ughrojpora	1152	594	558	749	269
		Ukardi	1299	612	687	555	458
Mehsana	Becharaji	Chandanki	318	149	169	195	121
MBSIR			12516	6445	6071	6463	5179

Table 2-2, Demographic Information, MBSIR

Source: Census of India 2001

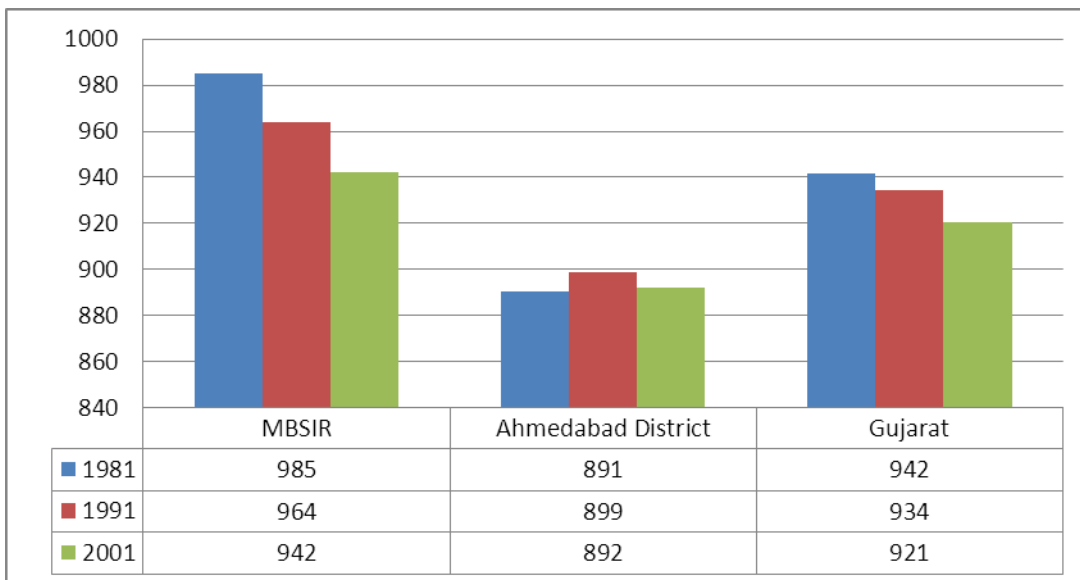
2.6.1. Average Annual Growth Rate (%)

Average annual growth rate is the rate at which population of a region increases in a given time period as a fraction of the initial population. Between 1981 and 1991 the average annual growth rate of population within MBSIR has been negative (-1.6 %) as compared to the positive growth rates of state and districts. However from 1991 to 2001 the growth rate has improved, but remained lower in comparison to state and district averages.



2-11, Average Annual Growth Rate

2.6.2. Sex ratio

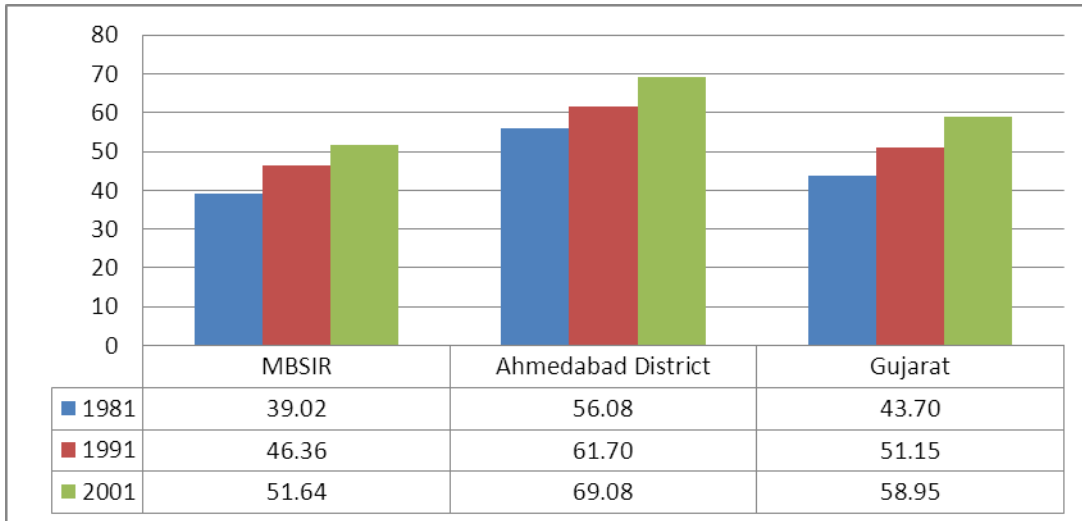


2-12, Sex ratio

Sex ratio is number of females per 1000 males. Sex ratio in MBSIR region is higher as compared to district and state averages.

Low population growth rate and high sex ratio as compared to District and State figures are indicative of major out migration from the villages within the SIR. Better work opportunities on development of the SIR may reverse the trends.

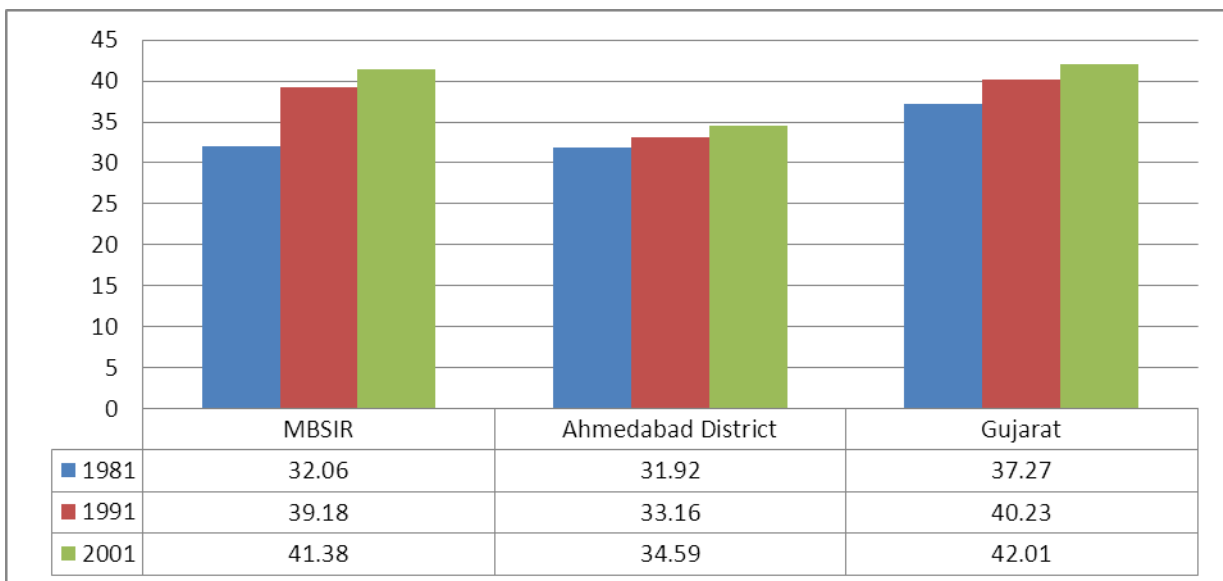
2.6.3. Literacy Rate (%)



2-13, Literacy Rate

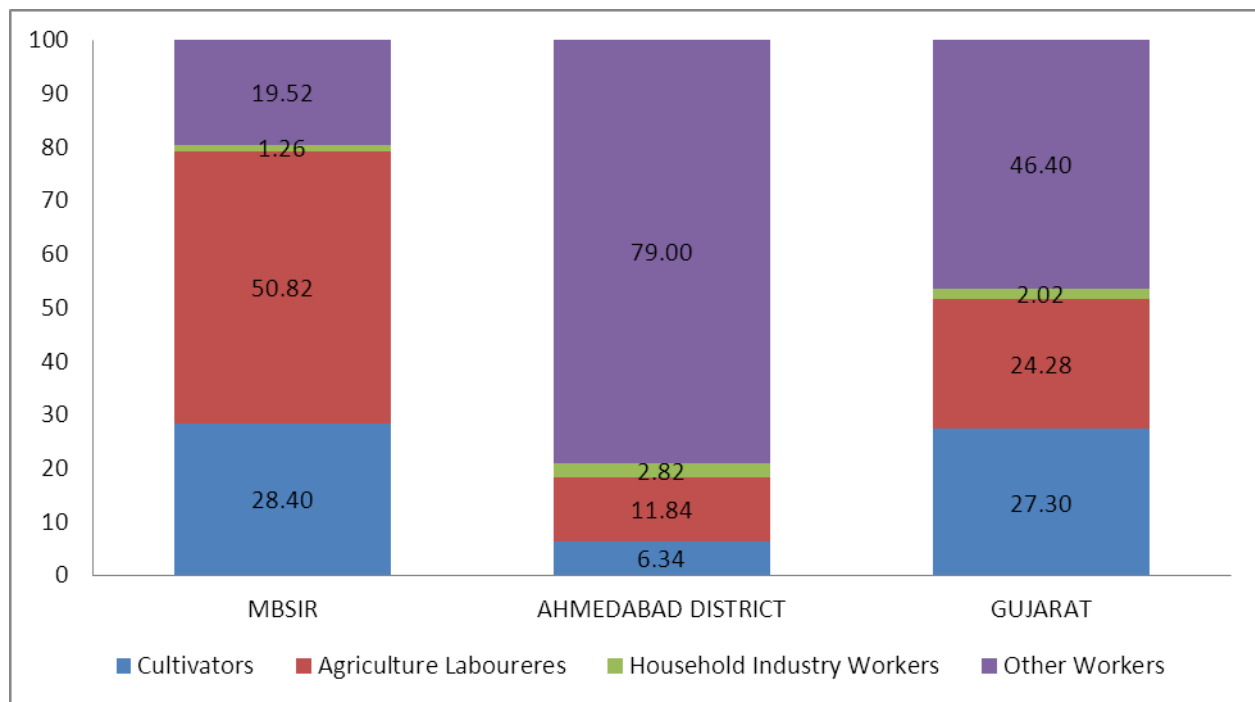
As per the census 2001, the average literacy rate within the SIR is 52%. This is lower than average rates of Ahmedabad district (69%) and Gujarat State (59%) indicates the need for education facilities and infrastructure through planned development in proposed SIR.

2.6.4. Work Participation Rate (%)



2-14, Work Participation Rate

Work participation rate is defined as the percentage of total workers (main and marginal) to total population. Almost 41% of total population residing in MBSIR is working population. Work participation rate of the region has been increased in last two decades. It is almost near to state averages.



2-15, Worker's Distribution

As per Census of India, workers are divided in four major categories i.e. cultivators, agriculture labourers, household industry workers and other workers. Out of these, cultivators and agriculture labourers comprise of workers involved in agriculture (primary economic activity). The other two categories of workers are involved in secondary and tertiary economic activities.

In MBSIR almost 80% of working population is involved in primary economic activities and the rest 20% involved in secondary and tertiary economic activities. Ahmedabad district has around 20% of working population involved in primary and rest 80% involved in secondary and tertiary economic activities. High dependency of working population in MBSIR on primary economic activities along with high number of agriculture labourers (50 %) indicates lack of economic opportunities in other sectors.

2.7. Social Infrastructure

2.7.1. Education Facilities

Sr. No.	Educational Facility	Number
1	Primary School	10
2	Secondary School	4
3	Senior Secondary School	0
4	College	0
5	Industrial School	0
6	Training School	0
7	Adult literacy Class/Centre	0
8	Other educational facilities	0

Table 2-3, Education facilities in MBSIR

Source: Census of India 2001

There are 10 primary schools in the region, suggesting that almost each village has a primary school. However there are only 4 secondary schools and no senior secondary schools between 8 villages, spread over an area of 102.10 sq. km.

There are no colleges, training schools or other education facilities available in the region. Nearest towns with these facilities are Kadi, Mehsana, and Ahmedabad on eastern side of MBSIR. Villagers on the western side of the SIR (Surendranagar district) travel around 20 – 25 km. to avail these facilities.

2.7.2. Health facilities

Health Facility	Number
Primary Health Sub Centre	2
Registered Private Medical Practitioners	1
Primary Health Centre	1
Family Welfare Centre	1
Child Welfare Centre	0
Allopathic Hospital	0
Maternity Home	0
Ayurvedic, Unani, Homeopathic Hospital	0
Ayurvedic, Unani, Homeopathic Dispensary	0
Health Centre	0
Nursing Home	0

Table 2-4, Health Facilities in MBSIR

Source: Census of India 2001

The region has only 2 primary health sub centers and 1 primary health centre and family welfare centres. There is no maternity home and allopathic hospital in the entire region of 102.10 sq. km.

2.8. Physical Infrastructure

2.8.1. Water Supply

Domestic water demand of the existing settlements is catered by GWSSB, from GWIL off-take point, Zinzuwada Branch Canal at Chainage+ 552.0.Km. from this branch canal about 18 mLd. of water is drawn for supplying to Mandal & Detroj Taluka villages. Water supply to Becharaji Taluka villages is through water drawn from Narmada Main Canal Off-take Point at Chainage + 313.63 Km.

2.8.2. Storm water and Sewerage

There is no major sewerage and storm water infrastructure in the region. The villages falling in the delineated region either have community level soak pits or very basic Sewage network. The villages do not have any Storm Water drainage infrastructure. The Storm Water runs through natural drains into the ponds and other water bodies.

It is observed that area under MBSIR is characterized by high outmigration, over dependency on agriculture and high number of agricultural laborers as compared to adjoining districts and Gujarat State. Development of new industrial areas can bring about change in overall well being for the people of the region while creating more economic opportunities along with quality social and physical infrastructure.

CHAPTER 3

DEVELOPMENT PLAN PROPOSAL

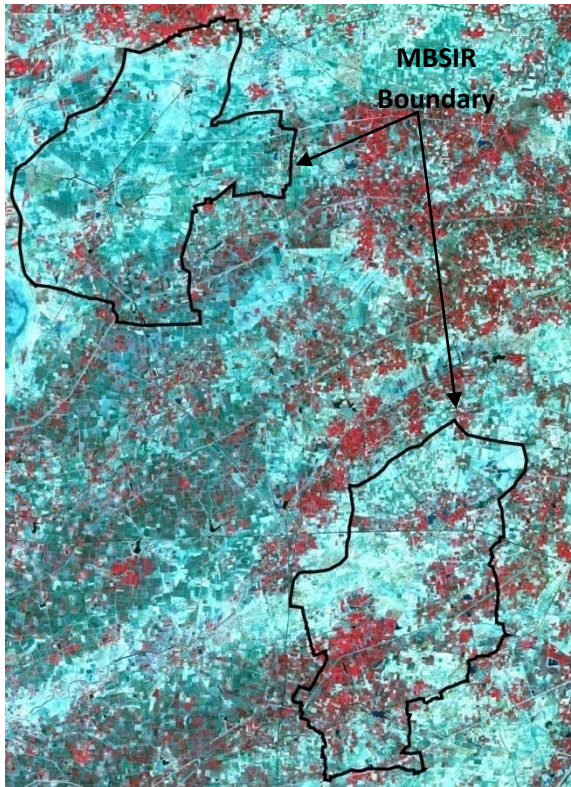
3. Development Plan Proposal

The purpose of the Draft Development plan is to set out the framework for the growth of MBSIR over a period of 25 years. Major components covered by the Draft Development Plan include:

- Preparation of Base map & Existing land use map
- Proposal for Land Use
- Proposal for Infrastructure development
- General Development Control Regulations
- Implementation strategy & Broad cost estimates

3.1. Preparation of Base map & Existing land use map

Preparation of accurate Base Map is one of the most critical components while preparing Development Plan. Latest (Dec 2012 – Jan 2013) satellite image of 6 Mt. resolution is acquired from National Remote Sensing Centre, Hyderabad to create an accurate Base map of MBSIR.

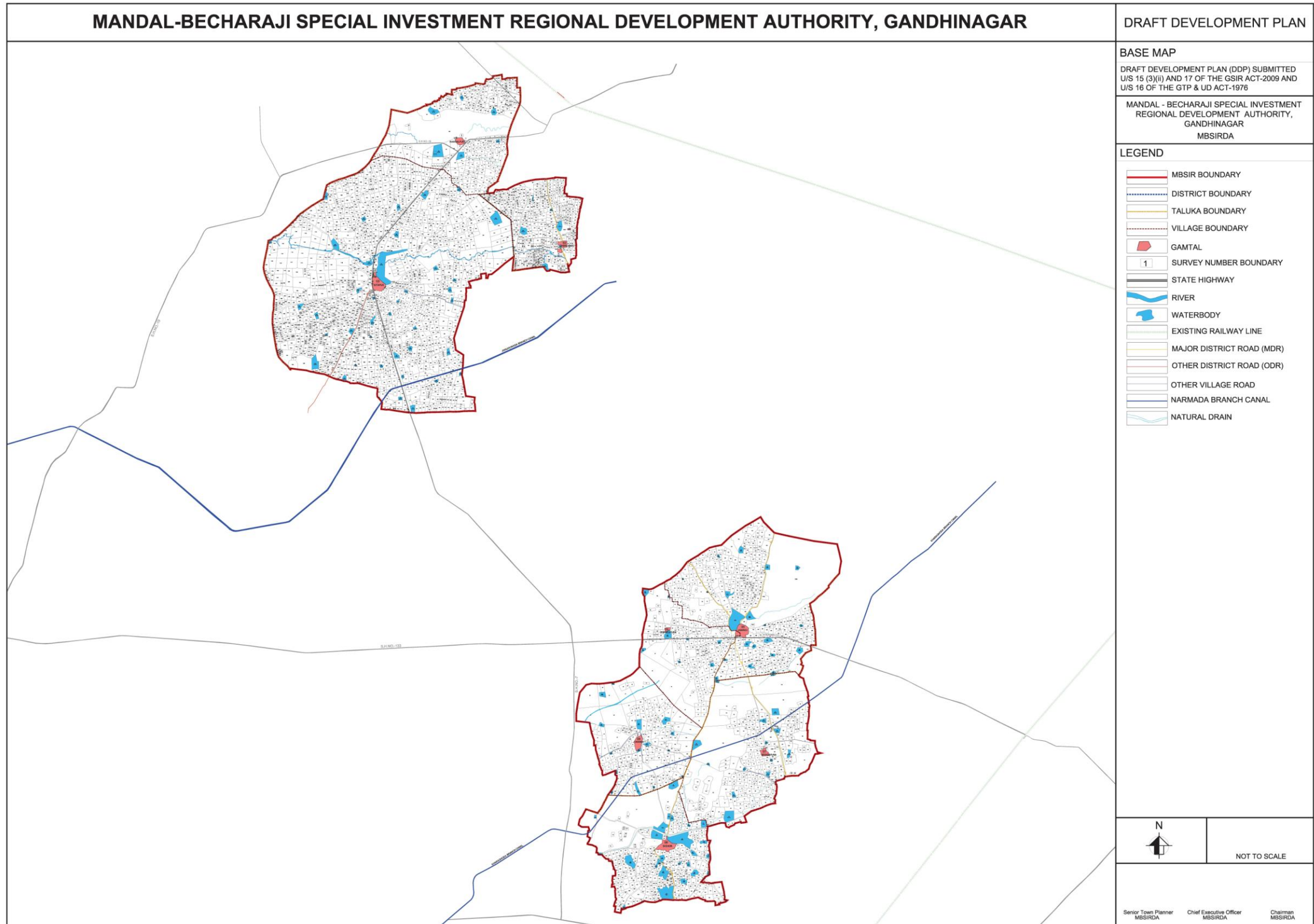


3-1, Satellite Image of MBSIR

Source: National Remote Sensing Centre, Hyderabad

Village Revenue maps (Tikka sheets) of all 8 villages within SIR limits were acquired from District Land Inspector of Records (DILR) Departments of various districts. The revenue maps were scanned, scaled and then digitized. In the process of digitization, some of the inherent mistakes in Tikka sheets like duplicate or missing survey numbers were identified, cross checked with other available data and updated. The map was further updated with information received from various concerned government departments. Each digitized village revenue map was then geo referenced over satellite image to create a combined base map. Site visits were carried out to acquire ground control points for exact superimposition of digitized village maps.

The final base map of MBSIR shows an area of 102.10 sq. km. which is more than the notified area (101.77 sq. km.) of MBSIR. The reference for area under notification of MBSIR is taken from Form 1A of all the villages, which is primarily a revenue record. One of the reasons for variation in area could be because of out dated revenue records.



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3-2, Base Map, MBSIR

3.2. Target Sector Identification

GIDB has been proactive to develop MBSIR as a world class automobile and manufacturing hub with well supported infrastructure and civic amenities. In the initial stages, GIDB undertook an exercise to access industrial development potential along with conceptual planning. The concept plan prepared focused on following components:

- Identification of the target sector and market assessment for industrial development
- Preliminary environmental and social assessment of the region
- Development needs and conceptual planning
- Development strategy in sync with the vision of SIR
- Infrastructure Master Plan
- Implementation model

Based on the market assessment of industrial scenario and Industrial Manufacturing Zone Policy by GIDB, potential industrial sector for MBSIR have been identified. Aiming to reduce the SIR's carbon footprint the proposed mix is of non-polluting and non-hazardous industries as per standards set by Ministry of Environment & Forests, Government of India.

3.2.1. Parameters for identification of sectors for SIR

Potential sectors have been identified based the below mentioned parameters:

- Prominent presence of industrial sector
- Anchor tenant and its supplier
- Resource availability
- Expression of interests
- Environmental considerations

Prominent presence of industrial sector

The region is primarily based on agriculture and does not show prominent presence of any industrial sectors, except proposed MSIL plant. The considerations related to proposed automobile plant will be taken care of under the head of anchor tenant and its suppliers.

Anchor tenant and its suppliers

MSIL is one of the automobile anchor tenants in the region. Cluster of its suppliers linking to different sectors hold position in the hierarchy. Technical heavy engineering and Light engineering including metal & alloy product form a direct link with the anchor unit and form an integral part of the chain. Electronics products are a part of the assembly line and are directly related to the design element of the vehicle. The auto components produced under this sector are specifically designed, keeping in mind the end product. Rubber products and Glass & fiber suppliers have a wide range of products for various Tier 1 or auto manufacturers. The product supply chain is spread over the country and has several market links. Hence dedicated rubber and glass units for MSIL have been considered to come up under service and ancillary industries. Logistics is directly linked to the supply chain and plays a key role.

Resource availability

Sectors with focus on the available local raw material from the natural resource base have advantage to bring benefit to the local economy. These sectors not only induce growth in the local economy, but hold potential to expand as export oriented industries.

Expression of interests

MOUs have been signed during Vibrant Gujarat 2011 for Ahmedabad, Mehsana and Surendranagar districts wherein investments of Rs. 1,17,057 crore have been proposed with an estimated employment generation of more than 7 lakh. Sectors such as automobile, engineering, knowledge & skill development and tourism have relative potential investment interest in the region which may be channelised to the proposed SIR.

Environmental considerations

Aiming to reduce the SIR's carbon footprint and promote primary economic sectors; land under agriculture is considered as one of the economic activities in the SIR. Proposed industrial mix should be non polluting or less polluting as per standards set by Ministry of Environment & Forests, Government of India.

3.2.2. Identified sectors

Based on the potential of the region, the investment scenario and thrust of the Automobile sector the following sectors have been identified in the proposed SIR:

- Automobile industry
- Auto-component Vendor park consisting-
 - Heavy engineering
 - Light engineering including metal & alloy product
 - Electronics
 - Service & Ancillary
 - Non Polluting industries including Information Technology
- Logistics

Further based on the key stakeholder suggestions and reference to the National Manufacturing Zone Policy, following sectors have also been included in the:

- Precision engineering
- Wind power equipment manufacturing
- Solar power equipment manufacturing
- Emerging sector in Automobile sector viz. Electronic Systems Design and Manufacturing (ESDM)

Apart from above Information Technology sectors have also been proposed.

In accordance with the SIR policy and Market assessment for industrial development undertaken during concept plan preparation it was suggested that around 35 to 40 % of total land area under SIR will be required for industrial activities.

3.3. Sustainable Population

3.3.1. Employment generation

Direct employment to be engaged in industries is calculated from sector wise ratios for workers per hectare. SIR based non industrial components of area are also expected to generate employment to serve the city population. This indirect employment from commercial, institutional and informal sectors is assumed to be 1:1.44 (as per UDPFI) of the direct employment. Direct employment generated from Industries proposed is around 1.25 lakh employees. The total employment (both direct & indirect), by the proposed industrial area and non industrial setups is projected to be about 3.04 lakhs.

Sr. No	Parameter	Estimated Number
1	Direct Employment	1,25,000
2	Indirect Employment	1,79,500
3	Total Employment	3,04,500

Table 3-1, Employment generation in MBSIR

3.3.2. Floating Employment

Out of the total employment generated in Special Investment Region, 80% is proposed to reside within SIR developed residential area, while the rest 20% is assumed as the floating population. Existing urban hubs such as Mehsana, Kadi, Sanand and Ahmedabad are residential towns which will provide human resource to the SIR. The residing population % has been proposed to be on higher side considering the fact that infrastructure shall be developed for catering to maximum requirement.

Sr. No	Parameter	Estimated Number
1	Floating Employment (20%)	60,900
2	Residing Employment (80%)	2,43,600
3	Total Employment (100%)	3,04,500

Table 3-2, Floating Employment

3.3.3. Population supported by MBSIR

The residing employment is proposed to settle in the SIR. An average family size of 3 has been considered for each employment generated (considering Gujarat Dependency ratio of 1:2). It is assumed that the existing Gamtal population (0.12 Lakhs as per census 2001) will increase at a faster growth rate due to the induced economic growth by the SIR. Rural population projected for 2040 is about 0.17lakh (annual growth rate of 0.82% is considered as per Concept Report for MBSIR). While the residing population calculated from total employment in the SIR is assumed to be around 7.29 lakh. Total population that will be supported by employment generation from SIR will be around 9.11 lakh for 2040.

Sr. No	Parameter	Estimated Number
1	Residing Population (2040)	7,29,200
2	Gamtal Population (2040)	17,000
3	Floating Population dependent on MBSIR (2040)	1,82,300
4	Total Population supported by MBSIR (2040)	9,11,500

Table 3-3, Total Population supported by MBSIR

3.4. Vision

“To develop a smart industrial city with concepts of reduce, recycle, reuse and efficient transportation network”

3.5. Planning Principles

The Draft Development plan is based on the application of spatial planning principles that ensure a consistent and coherent urban structure while providing flexible and economic development.

The specific concerns that MBSIR plan addresses include:

- Response to site topography & Environmental features
- Land use integration
- Integration of the canal network
- Integration of the existing village settlement
- Road network to facilitate efficient freight and public transportation movement

3.5.1. Response to Site topography & Environmental features

The site of MBSIR is predominantly flat. The natural ground slope is from North East to South West direction. Existing natural drains also follow the same slopes. As a response towards site topography major road network has been aligned along the direction of slopes. For developing the storm water drainage, catchment areas have been analyzed. This will economies the infrastructure costs while minimizing the impact on environment. For environmental conservation, it is proposed that recreation, sports and entrainment zones are developed around water bodies allowing development of public parks and gardens.

3.5.2. Land use integration

The Plan proposes that all industrial areas are located relatively close and accessible from residential areas, to minimise the home to work daily commute. The main industrial and logistics zones are all located centrally on either side of the truck priority road and the proposed expressway. Development of Knowledge and IT zone along side Recreation, Sports and Entertainment zone further integrates the land uses.

3.5.3. Integration of Canal Network

The region being within the SSNL command area has extensive network of SSNNL canals. With respect to the large industrial development in the SIR it becomes imperative to integrate the network of the branch canals with the planned development. MBSIR has 2 SSNNL branch canal passing through it that have a potential to be developed as public places. It is proposed to develop roads along the branch canals while promoting mixed use activities along with linear greens. Mixed use development comprising commercial facilities, recreation, residential will facilitate development of vibrant public spaces. In order to develop coherent public realm along the canal, urban design guidelines have been proposed in the plan.

3.5.4. Integration of existing village settlements

MBSIR includes 8 village settlements within its boundary. In order to allow each village to expand naturally at its own pace buffer zones have been proposed around each settlement. The role of the buffer is to allow development while creating a transition zone between Village settlement and High intensity urban development adjoining it.

3.5.5. Road network to facilitate efficient freight and public transportation movement

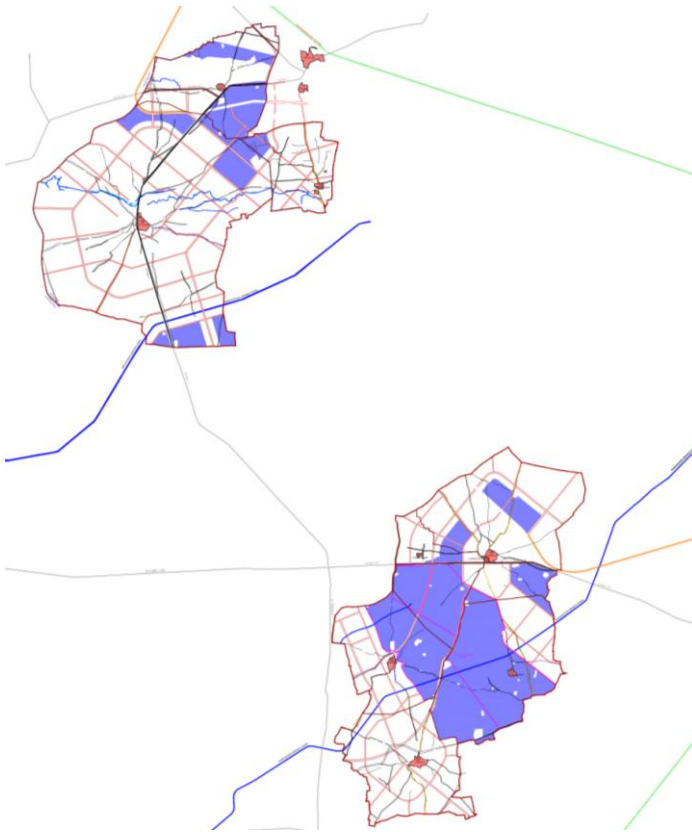
The regional connectivity in the MBSIR is strengthened through the provision of 90m wide express corridor with grade separated interchanges at key locations. The expressway to the SIR will allow speedy movement of cargo. The road network in the SIR is a combination of rectangular grid and loop roads. The grids are planned on a size of 800 Mt. x 1200 Mt. to promote development of walkable and cycle able neighborhoods.

3.6. Land Use Proposal

The Land use proposal is envisioned to promote economically vibrant and environmentally sustainable Industrial city with a good quality of life. The land use proposals area spread across below mentioned zones

- Industrial
- Logistics
- Knowledge & IT
- Residential
- Affordable Housing
- High Access Corridor
- Mixed Use
- Village Buffer
- Recreation, Sports and Entertainment

3.6.1. Industrial



3-3, Industrial zone

The industrial zones are planned strategically along the express corridor to ensure smooth movement of freight within the SIR. The industrial zones are flanked by Residential, Mixed use, Knowledge and IT zones on both sides. In context with regional connectivity and the proposed road network one interconnected industrial nodes is envisaged within the SIR. A total of 28.58 sq. km. (27.99%) is been proposed to be developed as the industrial zone in the MBSIR.

Sr.No.	Industrial Nodes near Anchor industry	Regional Connectivity (roads)	Railways
1	Near Hansalpur	Intersection of SH 7 and SH 19 near Hansalpur	Meter gauge railway connecting Patan and Kadi passes through Bechraji (Proposal for converting it to broad gauge already passed in railway budget 2013)

Table 3-4, Major Industrial Nodes

3.6.2. Logistics



3-4, Logistic zone

Industrial zones are supported by strategically located logistics parks in the SIR. The value enhancement due to presence of Logistic parks within the Industrial zones will be in terms storage and handling of freight.

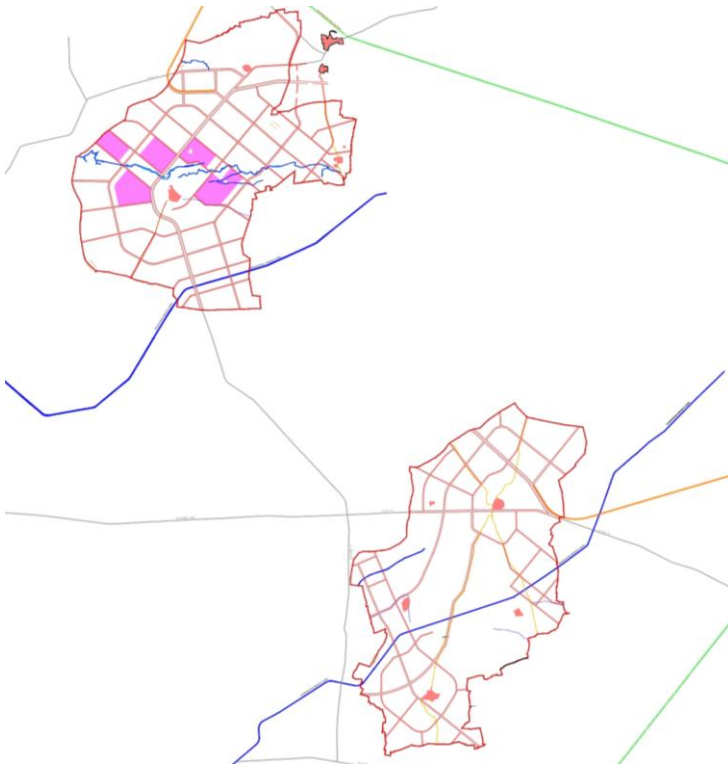
The logistics parks are located along Express corridor and proposed Railway sidings.

Within the MBSIR two logistic zones are planned along the main express highway.

Sr. No.	Logistics park	AREA (Sq, Km,))	Location
1	L1	1.10	Intersection of SH 7 and the broad gauge railway line from Mehsana and Ahmedabad (proximity to Hansalpur)
2	L2	1.00	Proposed express corridor near SH-133(Proximity to Ughroj)

Table 3-5, Location of Logistic zone

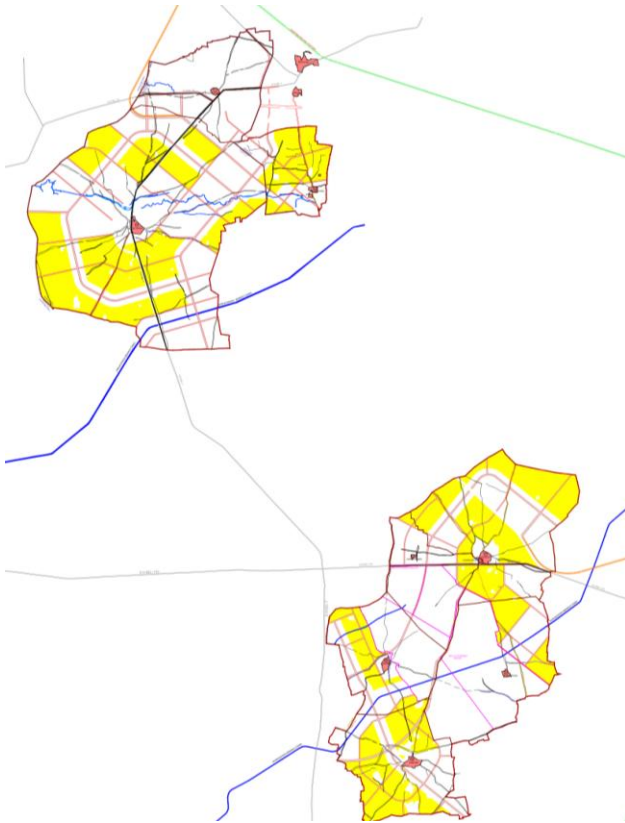
3.6.3. Knowledge and IT



3-5, Knowledge and IT zone

A Knowledge and IT zone has been proposed within SIR with a view to facilitate development of research centres, Educational Institutes and Universities along with IT industries. The Knowledge and IT zone is planned in surrounding of a non perennial water body in Sitapur village. The total land area allocated for the Knowledge and IT zone is around 3.69 sq. km. (3.61%). The area proposed for Knowledge and IT has been envisaged to support all the industrial centres proposed in the state with skilled labour force.

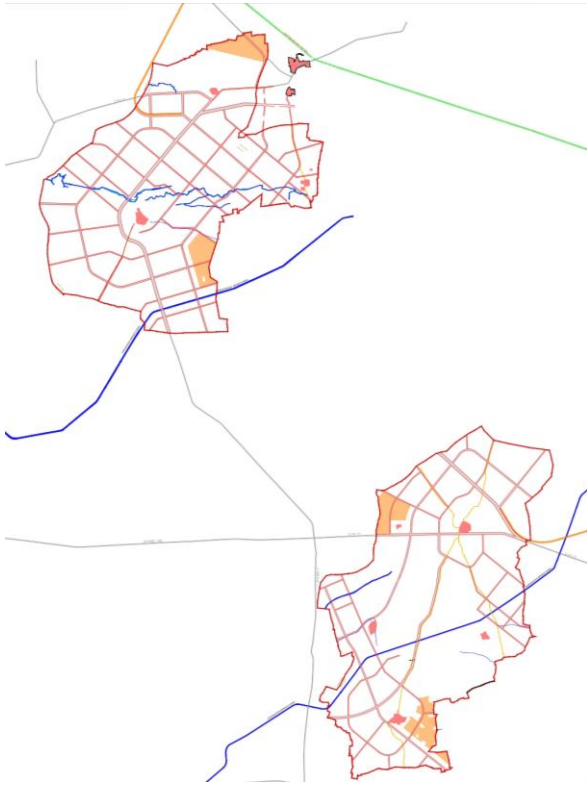
3.6.4. Residential



3-6, Residential zone

The residential zones within the MBSIR are planned along mix use & industrial zones. Residential development will also be allowed in knowledge and IT Zone and Mixed use zones. The total land area allocated for the Residential is around 31.31 sq. km. (30.67%). In addition to this around 0.60 sq. km. (0.59%) land will be occupied by existing villages.

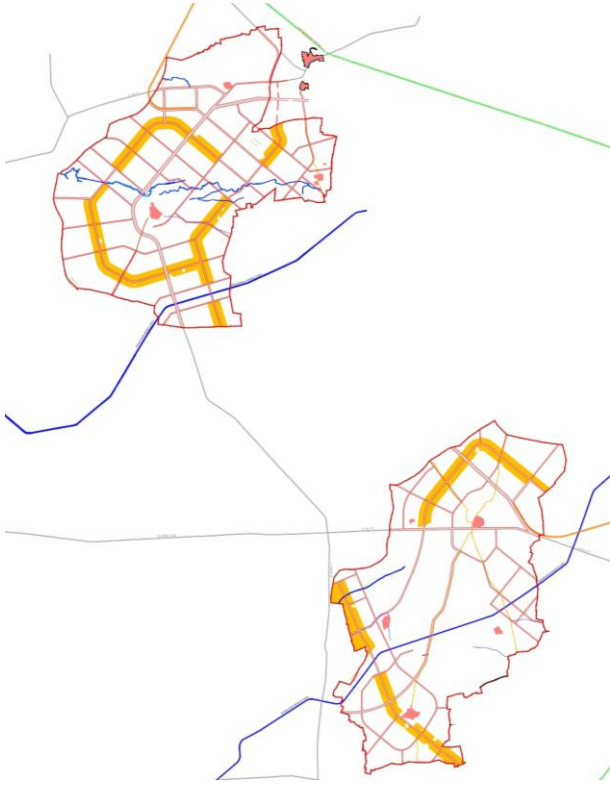
3.6.5. Affordable Housing



3-7, Affordable housing zone

The Affordable Housing zones are proposed in the village of Hansalpur and Sitapur of MBSIR. The total land area allocated for the Affordable housing Zone is around 3.82 sq. km. (3.75%).

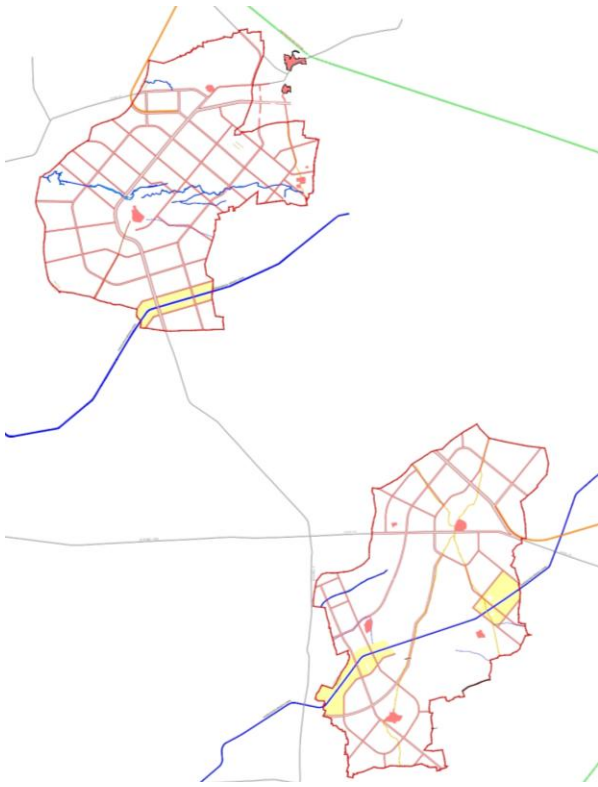
3.6.6. High Access Corridor



3-8, High Access Corridor

With a view to support higher densities and transit oriented development in MBSIR it is proposed to develop mixed use corridor along the 60 & 45 m RoW. This zone is predominantly planned between residential and industrial zones and will facilitate mixed uses including commercial, offices, recreation, community and residential. A total of 9.46 sq. km. (9.27%) is proposed under this zone.

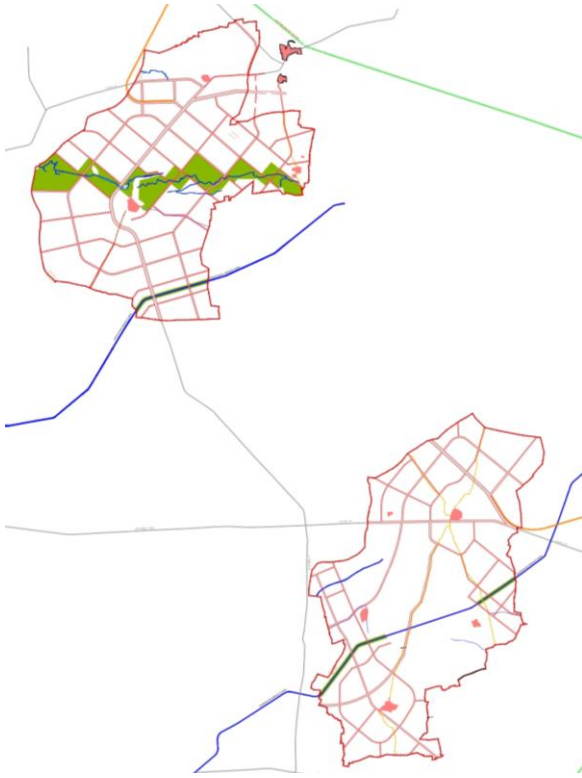
3.6.7. Mixed Use



3-9, Mixed Use

There are two SSNNL branch canal passing through the proposed MBSIR. The areas along the branch canals have a potential to be developed as large public spaces. Mixed land use zone has been proposed along the two branch canals. Mixed use development comprising commercial facilities, recreation, residential along with linear green zone will facilitate development of vibrant public spaces. Around 3.76 sq.km (3.68%) of area is proposed under mixed use zone along the branch canals.

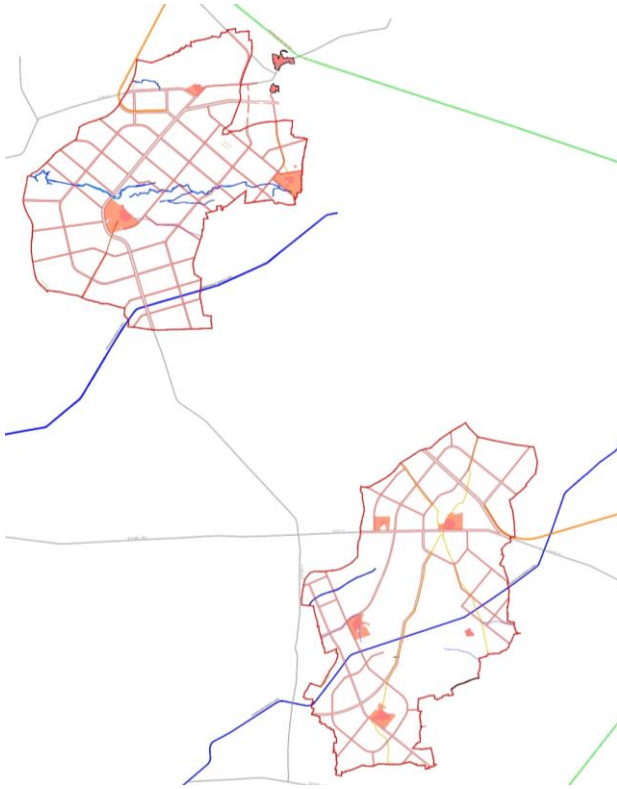
3.6.8. Recreation, Sports and Entertainment



3-10, Recreation, Sports and Entertainment zone

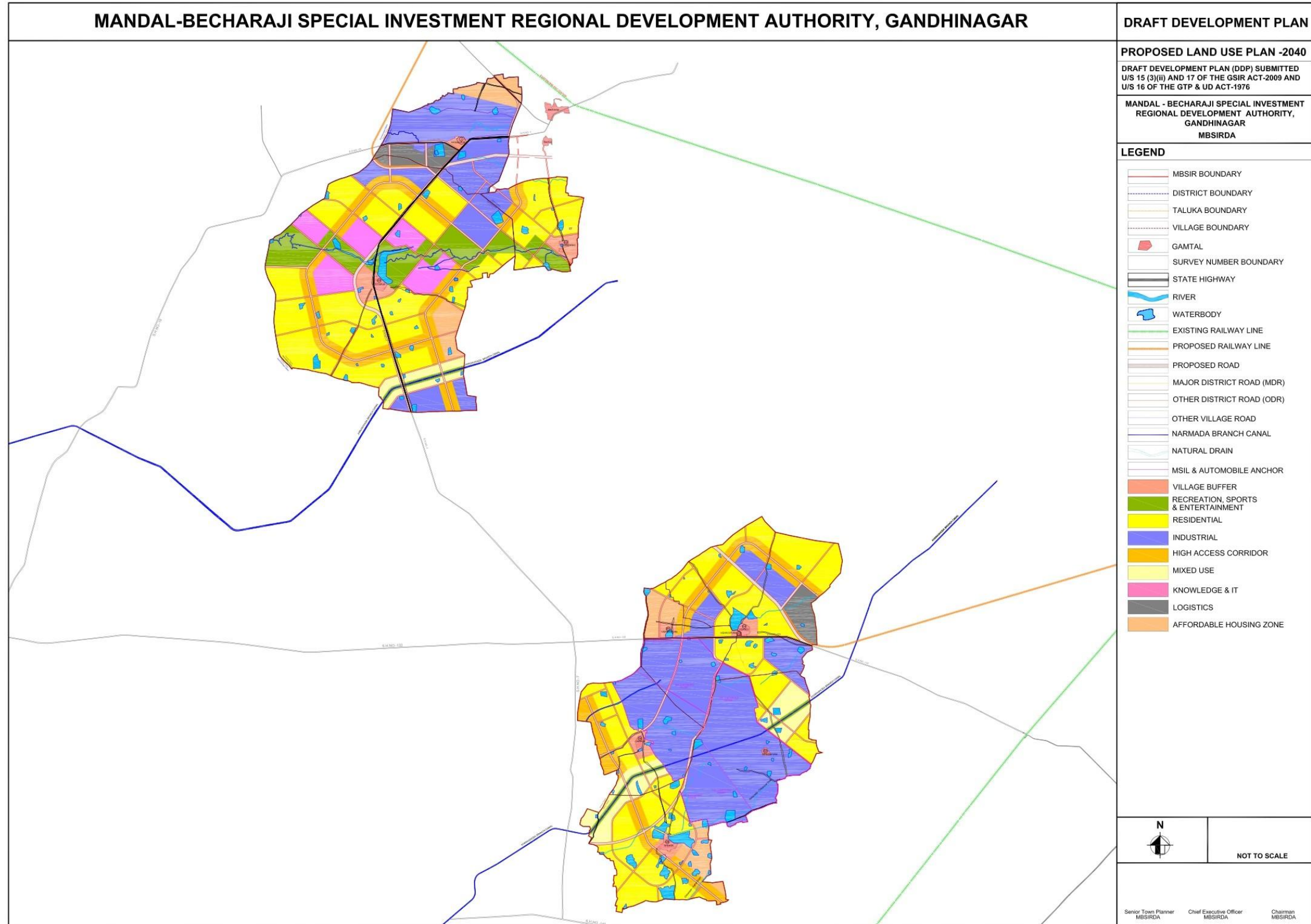
Around 5.79 % of total land area is proposed for development under recreation, sports and entertainment zone. This zone will allow development of botanical gardens, nature parks, sports complexes etc. It is strategically planned along the periphery of lake, natural drain and canal. This zone will benefit from the presence of institutional development in knowledge and IT zone.

3.6.9. Provision of village buffer



3-11, Village Buffer zone

MBSIR has 8 villages within the SIR. The Draft Development plan makes a provision for village integration to accommodate the growth in these settlements by constituting village buffer zones of 100m and 200m around each settlement. The buffer has specific regulations as per the GDCR. Residential, commercial and public facilities will be allowed in this zone.



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3-12, Proposed Landuse plan, MBSIR

Table 3-6, Area Statement MBSIR

Proposed Land Use	Comprehensive	
	Area (sq km)	Area (%)
Industrial	28.58	27.99
Logistics	2.10	2.05
Knowledge & IT	3.69	3.61
Residential	31.31	30.67
Affordable Housing	3.82	3.75
High Access Corridor	9.46	9.27
Mixed Use	3.76	3.68
Village Buffer	1.91	1.88
Recreation, Sports and Entertainment	5.91	5.79
Proposed Roads and Rail	7.17	7.02
Total Urbanizable Area (A)	97.71	95.70
River	0.27	0.27
SSNL Branch Canal	0.28	0.27
Water bodies	3.24	3.17
Gamtal	0.60	0.59
Total Non Urbanizable Area (B)	4.39	4.30
Total SIR Area (A + B)	102.10	100.00

3.7. Road and Rail proposals

3.7.1. Proposed Road network

The road network in the SIR is a combination of rectangular grid and loop roads. The grids are planned on a size of 800 Mt. x 1200 Mt. to promote development of walkable and cycleable neighbourhoods.

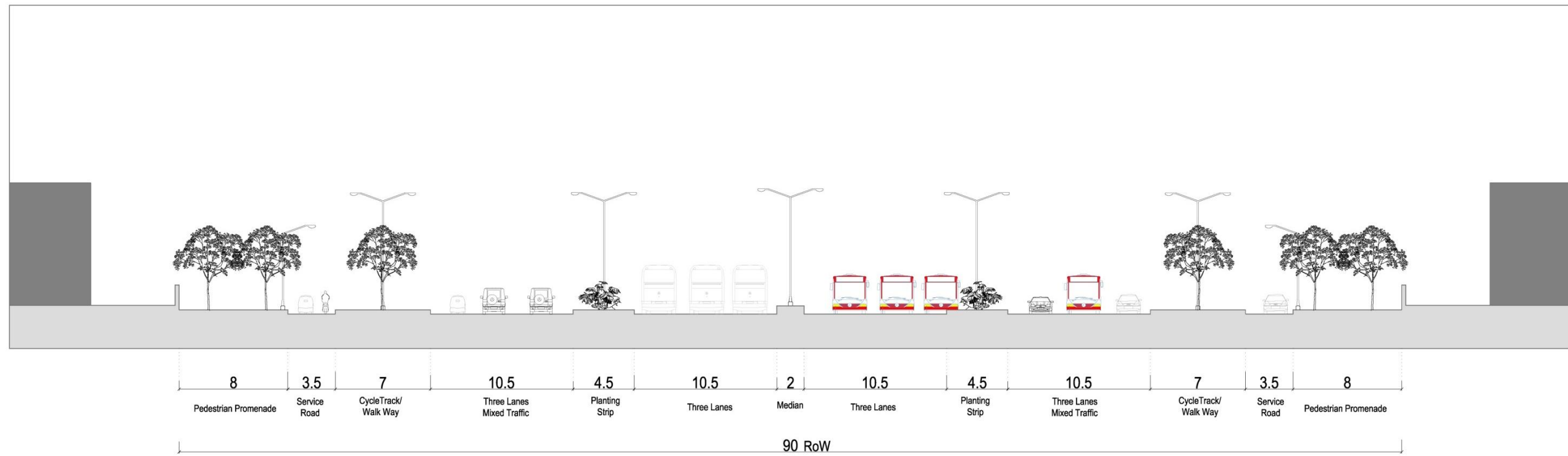
The proposed road hierarchy in the Draft Development Plan is:

- 90 Mt ROW - Express corridor
- 60, 45 & 30 Mt ROW - Arterial roads

Roads lower than 30 Mt. ROW in the SIR will be proposed during preparation of town planning schemes.

90 m ROW Express Corridor

The Plan intends to develop a transport corridor that contain a high capacity, limited access expressway, with grade separated interchanges at key locations. The proposed expressway would commence from Ughroj in the South East of the proposed SIR boundary on SH-133 and meet SH-7 at Sitapur Village and then head toward Hansalpur - Becharaji in the North. The proposed expressway would be of 90m Right of Way (RoW) having 3-lane carriageway whereas the remaining width of the proposed RoW would be utilized for other road infrastructure network.



3-13, 90 mt. Row, Road Section



3-14, 60 mt. Row, Road Section



3-15, 45 mt. Row, Road Section



3-16, 30 mt. Row, Road Section

Arterial Road (60m RoW):

These roads have been proposed with 3-lanes consisting of service road on both sides with cycle track & pedestrian path along with necessary supporting infrastructure. The proposed road may be strengthened and widened to 6-lanes in the future as the traffic grows with time.

Arterial Road (45m RoW):

These roads have been proposed as a loop road with 3-lane carriageway and may be strengthened and widened up to 6-lanes at a later stage. This road is planned to function as a public transit corridor with mixed use development along it and connecting various residential and industrial sectors.

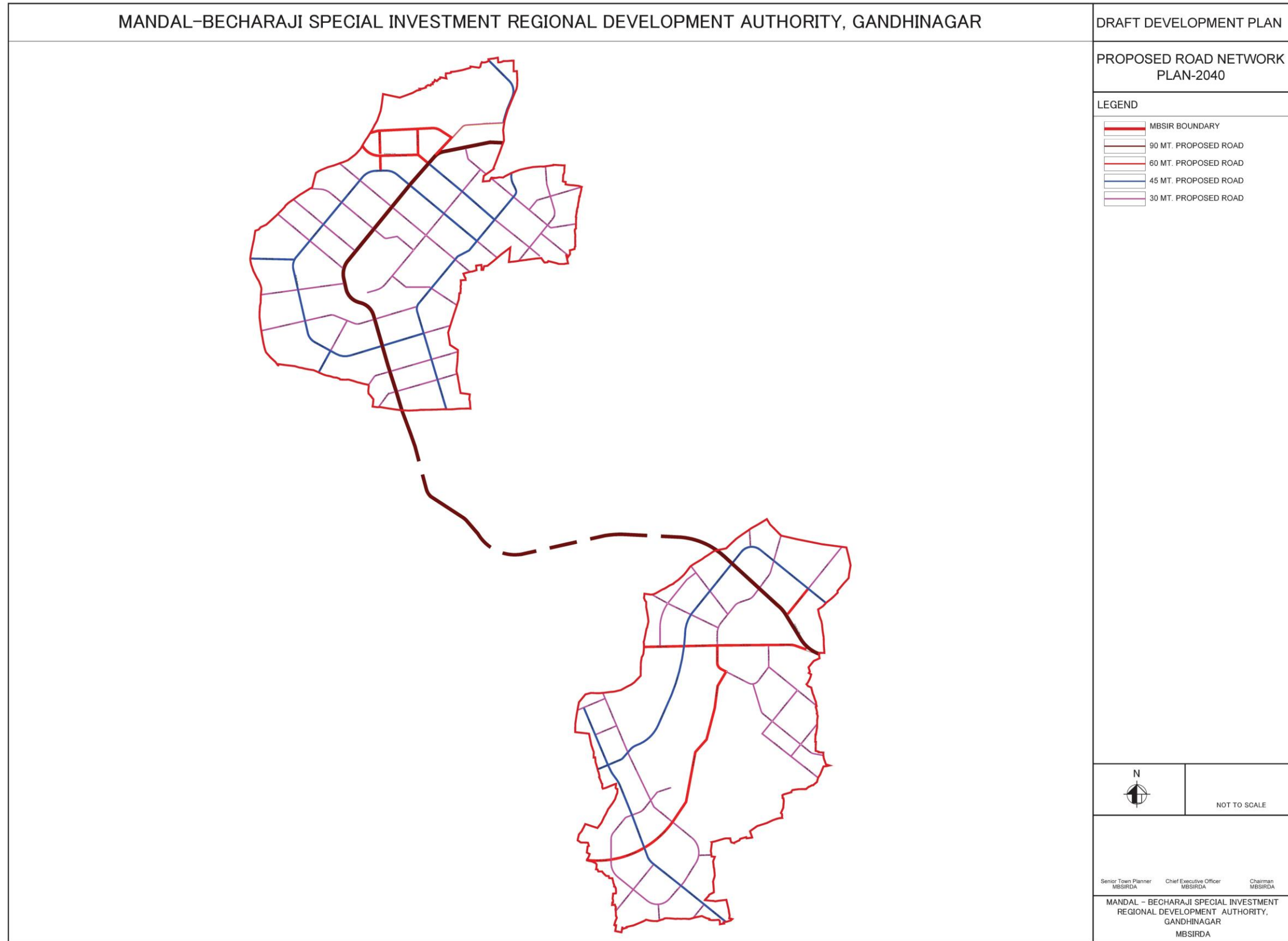
Sub Arterial (30, m RoW):

These roads would be proposed at detailed planning stage would be the key roads for local traffic movement. They would primarily serve the non-processing area traffic and act as a feeder to the proposed 45m RoW.

Internal roads shall be planned & designed in such a way that maximum of existing alignment of VR, MDR, ODR category roads get utilized while preparing Town Planning schemes for the proposed SIR or during detail planning of the region.

Sr.No	Road Type	RoW (Mt.)	Total Length (km)
1	Express Way	90	14.6
2	Arterial road	60	23.9
3	Arterial road	45	42.8
4	Sub Arterial road	30	88.0
Total			170.0

Table 3-7, Proposed Road Network



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3-17, Proposed Road Network, MBSIR

3.7.2. Cross Drainage Works & Flyovers

Along all the proposed roads, careful consideration has been given to planning of cross drainage works and flyovers. Minor bridges and Major bridges have been considered at water crossing (Canals, minor rivers, etc.) along the express highway. Pipe culverts, minor bridges have been considered for other roads at suitable intervals as per standard requirements. Types of bridges, culverts and flyovers shall be worked out during detail engineering based on detail soil investigation, hydraulic requirements, performance requirement, and techno economic feasibility as per the prevailing/related standard codes of practice.

3.7.3. Proposed Railway Siding Infrastructure

It is assumed that considerable passenger traffic would be generated with the development of the proposed SIR. Also, the proposed SIR would be primarily developed as an Auto and Auto-ancillary Hub, as a result there would be tremendous freight traffic and appropriate number of railway sidings would be required. Detailed studies need to be carried out to understand and assess the required amount of railway sidings and supporting infrastructure. A tentative railway siding plan is laid on the Development Plan and accordingly the lengths are derived and considered for cost estimations.

Sr. No.	Description	Length (km)	Cost Rs (Crores)
1	Railway Line 1- North	8.3	83
2	Railway Line 2 – South	13.6	136
Total		21.9	219

Table 3-8, Proposed Rail Network

3.8. Infrastructure Proposals

3.8.1. Proposal for Water Supply Scheme

The total water demand by the end of the proposed SIR would be 269 mLD & fresh water demand is 161 mLD. The source for the estimated water demand is proposed from the existing Narmada canal. The Water demand is worked out as per norms laid down by *Central Public Health & Environmental Engineering Organization, Ministry of Urban Development, Gov.* (CPHEEO). The Off-take point is proposed on Zinzuwada Branch of Narmada Main Canal. A detailed water supply scheme with water treatment plants, clear water pumping station, water distribution system and network is proposed in the Draft Development Plan.

Off-take point on Zinzuwada Branch of Narmada Main Canal

Off-take point shall be near the first cross-regulator on Zinzuwada Branch Canal. The full drawing capacity of this off-take point may be kept as 269 mLD. The RCC duct with screen & gates will be constructed near canal for drawing 269 mLD capacity of Water.

Raw Water Pumping Station

Raw Water Sump and Pump house for 2 hrs. Storage Capacity (civil work) for 269 mLD water requirement will be constructed near off-take point for pumping water into Water Treatment Plant. Pumping machineries and all related Electrical-Mechanical provision will be installed as per requirement with stand by provisions.

Water Treatment Plant

The Raw Water from Canal will be conveyed to the proposed Conventional Treatment Plant. 161 mLd capacity conventional WTP will be constructed at Canal for Phase 1 & 220 mLd capacity for Phase-2 as and when required.

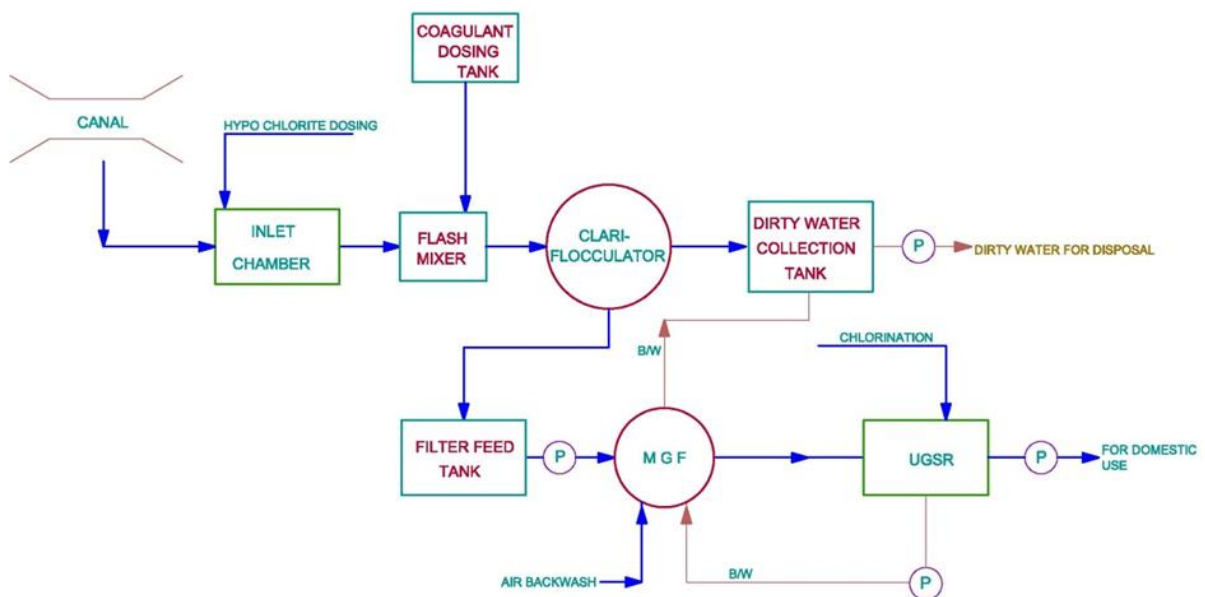
The type of treatment process usually depends on the quality of raw water required quality after treatment. Detail of treatment Unit & its process is given as under:

Sr. No.	Treatment Unit	Process
1	Cascade Aerator	To add oxygen to water for imparting freshness. Expulsion of CO ₂ , H ₂ S for removal of taste & odour. For Removal of impurities like Iron & Manganese etc.
2	Flash Mixer	For rapid mixing of coagulant in water to help in formation of micro-flocks.
3	Sedimentation Tank	To remove readily settling sediments such as sand, silt, turbidity, iron etc.
4	Rapid Sand Filter Unit	To remove suspended & colloidal impurities such as microorganisms, silt clay etc.
5	Chlorination Unit	For destruction or inactivation of pathogens, bacteria, helminthic etc.

Table 3-9, Treatment units for Water Supply

Flow Diagram for Conventional Water Treatment Plant for SIR is as under:

- Clear Water Pumping Station:** After providing necessary treatment, treated Water will be stored in underground RCC Storage Reservoir. RCC reservoir shall be provided with compartment with necessary gate / valve arrangement & it will be constructed as per phase-wise requirement. Necessary pumping machinery and all related Electrical & Mechanical equipments with necessary stand by provisions shall be provided to pump treated water to various water distribution stations.

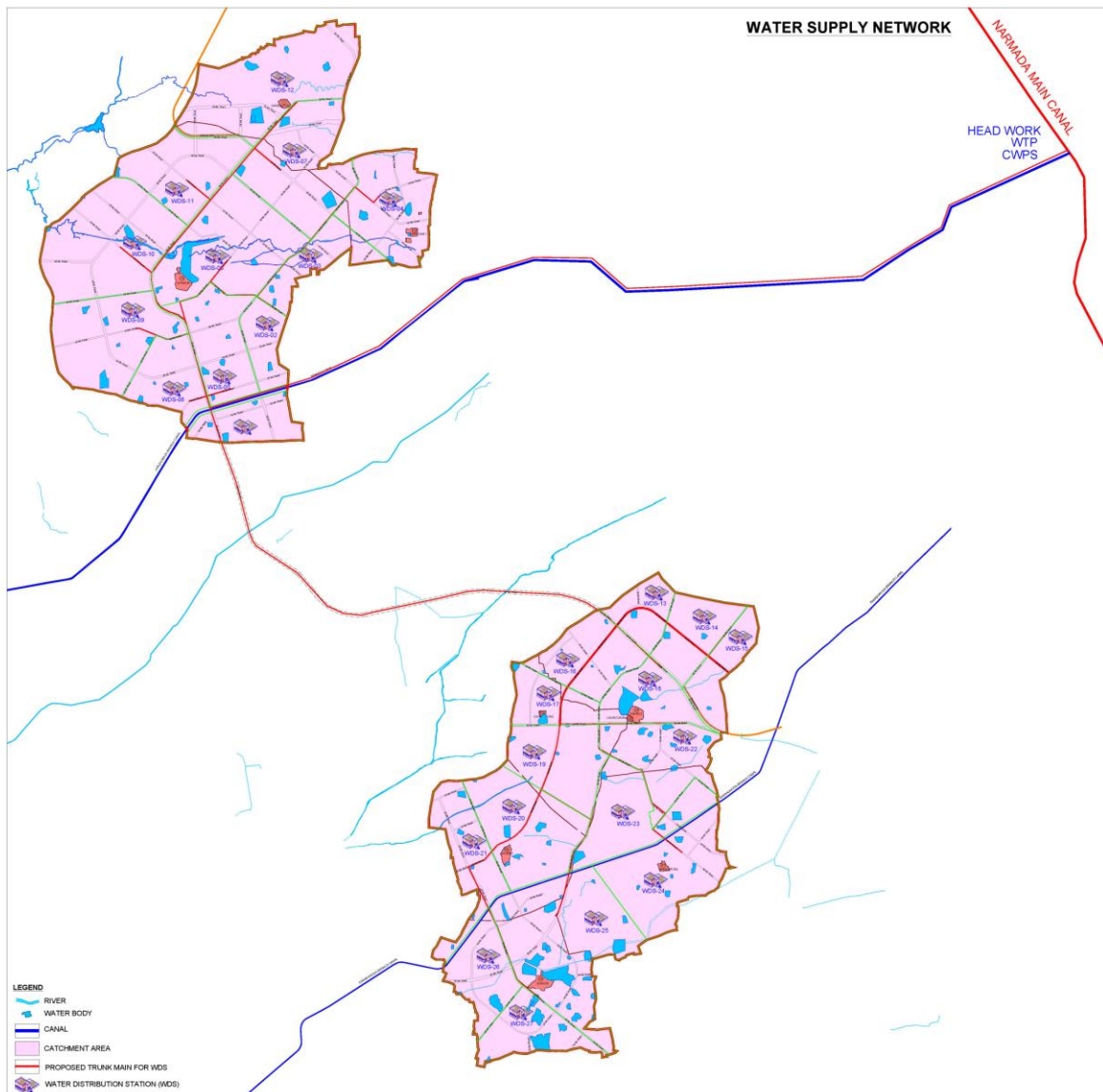


- **Clear Water Trunk Main:** Clear Water Trunk Main of Ductile Iron Pipe (DI K-9) will be laid from clear water pumping station to various distribution stations. Ductile Iron pipe of required size with inside lining & outside coating will be laid along with sluice valve/ butterfly valve for inspection purpose, scour valve for maintenance purpose & air valve to control surge pressure as per design. Proper encasing for minor/major crossings & Thrust block at deviation angles will be provided for proper functioning of the pipeline.
- **Water Distribution Stations:** Water will be pumped from clear water pumping station to various water distribution stations in 22 hrs. & water will be supplied to each distribution zone 24 x 7. RCC sump with pump house to accommodate pumping m/c & related E&M equipments will be constructed. The pumping Head of machinery will be kept to maintain minimum 7 to 12 Mt. residual head at consumer end.
- **Distribution Network:** The purpose of distribution system is to convey whole some water to the consumer at adequate residual pressure in sufficient quantity at convenient points. Water is made available to consumer either by continuous system or through intermittent system.

In SIR region water supply distribution will be 24x7, and all connections will be metered. Continuous water supply is proposed for following reasons.

- In intermittent water supply investment for constructing storage, pumping machinery distribution pipeline network will be more.
- No water from an intermittent water supply system is safe to drink, because under vacuum conditions foul water can be drawn into the pipes. Hence higher dues of chlorine are needed.
- Compared with 24 hours supply, intermittent supply uses more water.
- In intermittent supply, in case of fire, immediate supply is unavailable.
- Due to frequent operations of valves for intermittent supply frequent wear & tear on valves.
- For proper operation & maintenance more manpower is needed in intermittent supply.

In the proposed SIR, Ductile Iron pipe will be laid for proper water supply distribution with all valve & fittings etc. supply enough quantity of water to each consumer with required residual head & pressure.



3-18, Water Supply Network

3.8.2. Proposal for Sewerage Scheme

At Present there is no underground sewerage System in the SIR area and the general practice is of on-site disposal through either soak-pit or release in open drains leading to contamination of ground water & the environment. As calculated, 94 mld of sewage flow will be generated at the end of complete development of proposed SIR. For proper collection & disposal of sewage, proper sewerage Network will be laid. A detailed sewerage and drainage scheme is designed keeping in mind the CPHEEO guidelines.

Sewage Collection Network

The pipe line is designed for pipe running 80% full capacity from consideration of ventilation in sewers. The flow velocity in the sewers is such that the suspended materials in sewage do not get silted up i.e. the velocity will be such as cause automatic self cleaning effect. Hence, sufficient gradient is provided in Sewage Collection Network. Manholes i.e. Junction Manholes & Scrapper Manholes are provided for

inspection, cleaning & other maintenance at 30 m. to 45 m. c/c. with a removable cover to with stand traffic loads in sewers. Hence approximately 172 Km. length of Sewerage Network is proposed.

Sewage Pumping Stations

Sewage Pumping Stations is proposed for pumping the sewage from a deeper sewer to a shallow sewer or for conveying Sewage to Sewage Treatment Plant. With respect to the large area of SIR, a numbers of intermediates sewage pumping stations are proposed constructed. It is proposed to have 17 sewage pumping stations based on the topography, depth of sewer & Sewage flow.

Sewage Pumping Stations comprises of following units:

Units	Purpose
Screen Chamber	To trap the floating matters which otherwise can lump in the impeller of the pump.
Grit Chamber	Removal of grit at the sewage pumping station to safe guard the same from causing wearing of the pump impeller. Detritors or grab-bucket is planned to be installed for removal of Grit.
Wet Well	It is provided in order to accommodate pumping machineries with enough working & stand by. Proper detention time in wet well should be provided. i.e. 5 to 30 min. of average flow.

Table 3-10, Sewage pumping station units

Sewage pumping stations is constructed in RCC with proper floor slopes, interior lining & water proofing for resistance against H₂S, lighting & ventilation. All Electrical & Mechanical work including lifting arrangement, D. G. Set etc. are installed for proper working of sewage pumping station. Pumping machinery is planned to be installed in such a way that, sewage will be pumped in peak & lean period

Pumping Main

The economic size of pumping mains are worked out on peak flow volumes Pumping Main from Pumping Station to Sewage Treatment Plant are laid for transporting the sewage in the inlet chamber of STP and D.I. / GRP pipe are provided with proper in lining & out-coating to prevent corrosion. Size of pipe depends on length of pipe, depth of SPS, capital & Capitalized cost of pipe & pumping machinery. Pipe is provided with proper cushion with air valves, sluice valves etc. for proper maintenance encasing are provided at major crossing.

Sewage Treatment Plant

In MBSIR region, sewage is treated & reused after proper treatment. The waste water reuse will be applied for various beneficial as stated:

- Flushing, Washing, Gardening
- Irrigation
- Industrial process, washing etc.

Wastewater treatment processes can be categorized into the following three:

Physical process: Impurities are removed physically by screening, sedimentation, filtration, flotation, absorption or adsorption or both, and centrifugation;

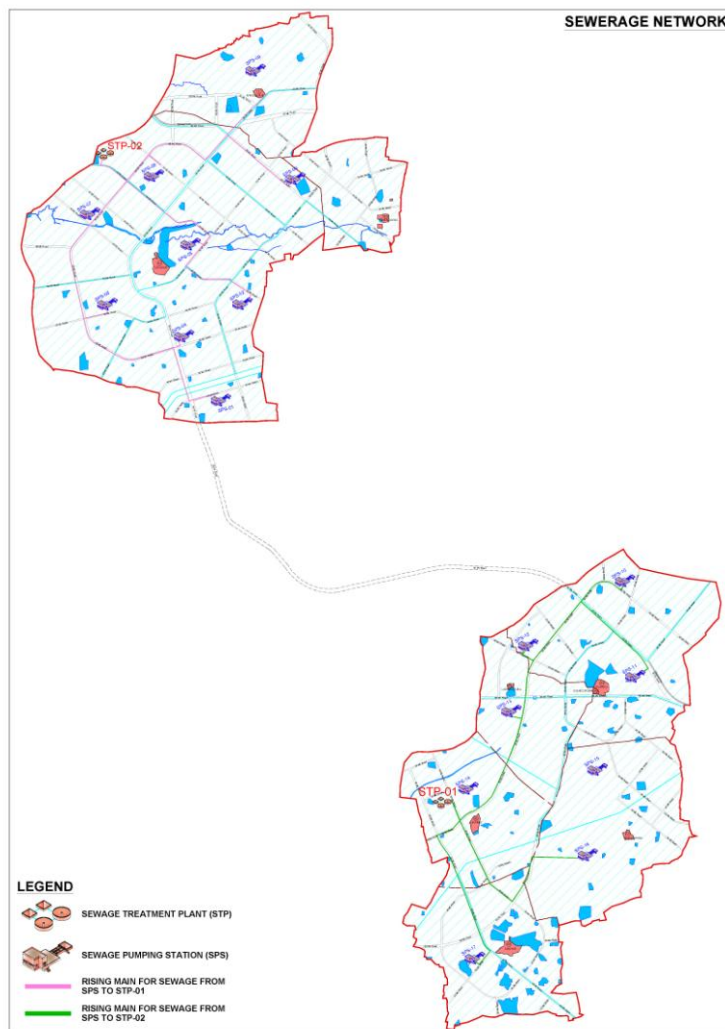
Chemical process: impurities are removed chemically through coagulation, absorption, oxidation-reduction, disinfection, and ion-exchange;

Biological process: pollutants are removed using biological mechanisms, such as aerobic treatment, anaerobic treatment and photosynthetic process (oxidation pond).

Conventional wastewater treatment consists of the following stages: Municipal wastewater treatment facilities use combinations of physical, biological and chemical treatment technologies.

- Preliminary and primary treatment: Preliminary and primary treatments are usually associated to screening for the removal of debris and large solids, and sedimentation.
- A secondary treatment: may utilize biological processes, such as stabilization ponds, trickling filter, oxidation ditch, and activated sludge, which is then followed by sedimentation of biomass (sludge).
- Tertiary treatment: It is ced treatment is an additional treatment for higher-level removal of specific pollutants, such as nitrogen or phosphorus etc.

In SIR, the Total Sewage Generation will be 94 mLd. Two Sewage Treatment Plants are proposed for the Scheme.



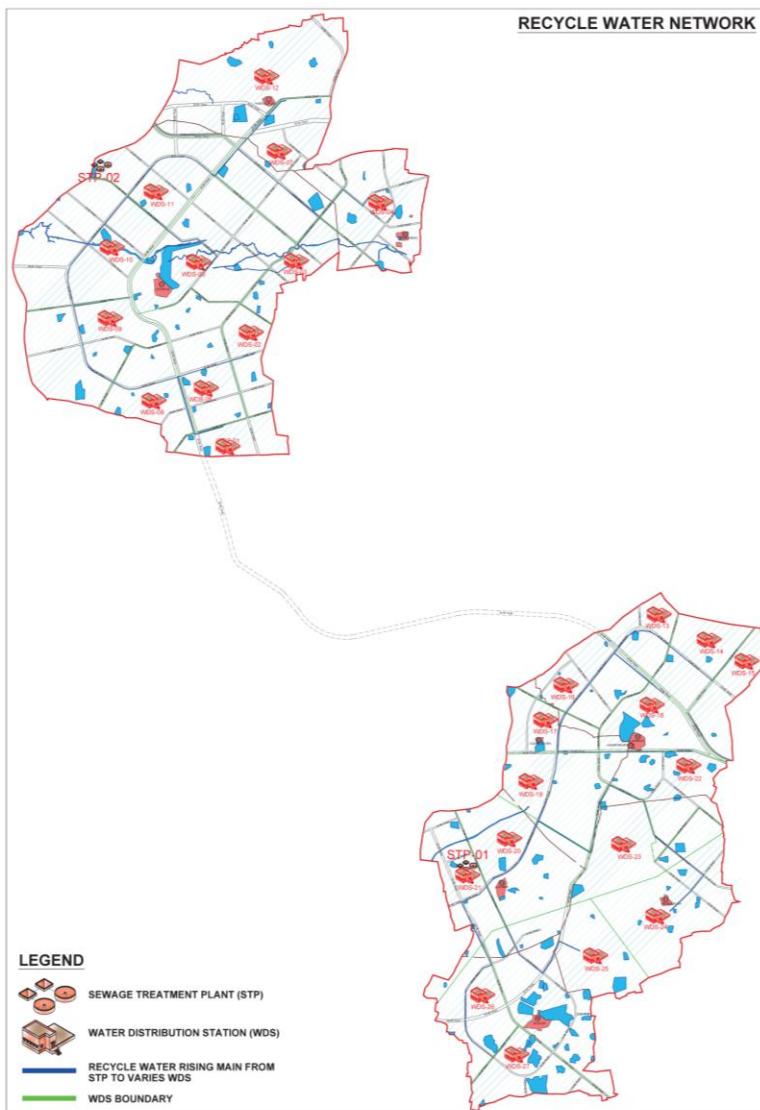
3-19, Sewage Network

3.8.3. Recycled Water System

The treated waste water through recycled pumping station is planned to be transferred to various recycled water distribution stations that are constructed in same campus of fresh water distribution stations so that operation & maintenance is easier. Recycled water pumping stations will be constructed with pump house and pumping machinery will be installed to match with capacity of STPS.

Recycle water is supplied 24 x 7 same as fresh water supply. D. I. pipeline network is to be laid separately with valves, valve chambers, encasing & thrust block etc. as per requirement.

Electrical & Mechanical work will be installed as per requirements



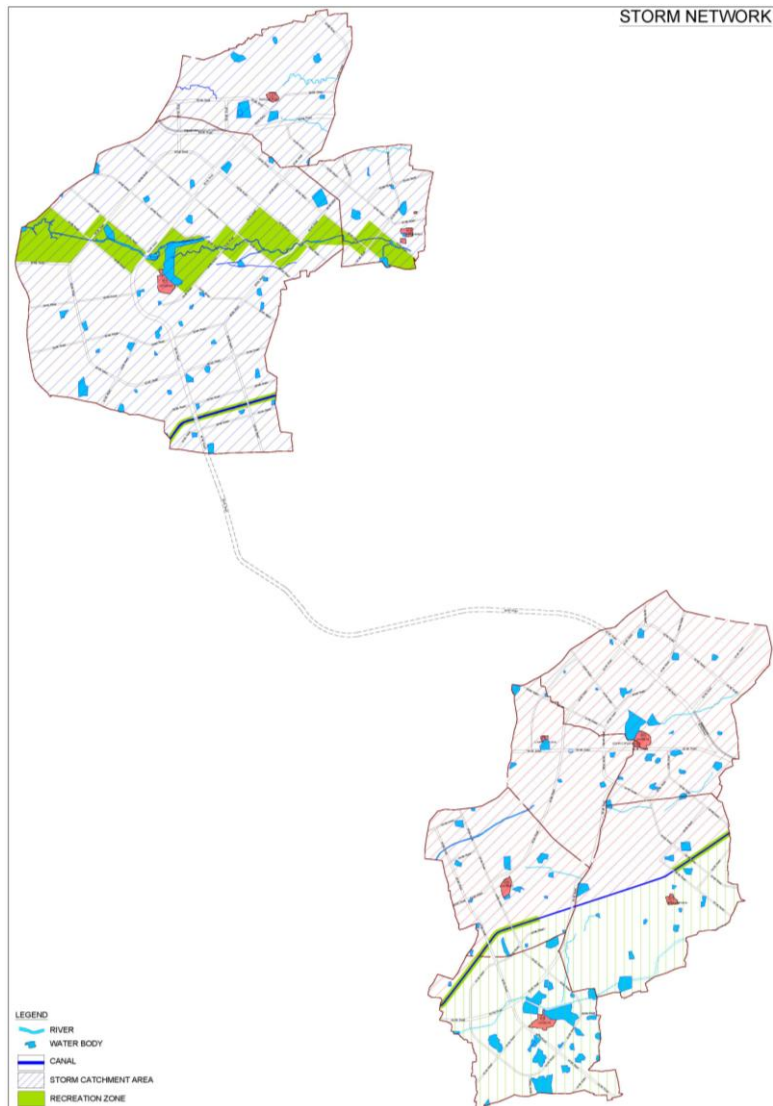
3-20, Recycle Water Network

3.8.4. Proposal for Storm Water Disposal System

In order to plan an effective design of storm water drainage system, several aspects are considered and the entire region is evaluated with respect to storm water on parameters including topography & rainfall pattern.

Based on catchment area, co-efficient of run-off & rainfall intensity the storm flow is worked out to siphon the storm flow from SIR. It is planned to provide Catch pit with pre-cast perforated Jali to catch the storm water. Also 300 mm/450 mm dia. pipe are laid from catch pit to main storm water line at 30 to 45 m c/c. R.C.C. storm water network are laid with Manholes at 30 m. /45 m. c/c for proper functioning & maintenance of system. It is planned to dispose the storm water drain in natural drains/lakes and provide recharge wells or rainwater harvesting structures, which results in the rise of ground water level of the area. Other than recharging well, it is made compulsory that each building / industry should collect roof-top rain water in the underground tank in their premises.

The capacity of underground tank should be kept based on roof-top area & annual rainfall of the area. This collected rainwater can be used as fresh water after proper treatment & in rainy days which reduces the fresh water demand.



3-21, Storm Water Disposal Scheme

3.8.5. Solid Waste Management Proposal

It is proposed to provide sanitary landfill site as a necessary and integral part of the solid waste management solution for the proposed SIR area. Total land required for land.

Potential Landfill Site Identification

The selection criterion of landfill site is prima facie based on guidelines developed by Management of Municipal waste as a first step of site assessment and investigation.

Accordingly, after stakeholder consultation, a site is planned to be identified for proposed landfill, which includes area for engineered landfill operations, compost plant including segregation area and buffer zone. Total tentative estimated cost of proposed solid waste management is around INR 68.14 Crores, including collection storage, transportation, treatment and disposal facilities along with infrastructure cost.

3.8.6. Power

From the power demand projections, it is estimated that approximately 300 MW power is required for industrial purpose whereas about 110 MW power is planned to be required for residential purpose. The total estimated cost of the proposed power supply infrastructure is approximately INR 660 Crores. The block cost is based on the preliminary information available and will be revised during detailed engineering design stage. Cost estimation is done on the basis of details provided by GETCO and ball park costs.

3.8.7. Gas & Telecommunication

Following broad aspects related to the Gas infrastructure have been broadly discussed with the Government of Gujarat.

- Gujarat State Petroleum Corporation (GSPC) network runs in the vicinity of the proposed SIR.
- In Phase – 1, GSPC network shall be extended from Mehsana to Becharaji to serve the Auto Industries proposed in the SIR.
- In Phase – 2, GSPC network shall be extended from Kadi to Ughrojpura to serve the Auto Industries and residential townships that would be developed in the proposed SIR.
- Gas Supply Restrictions shall also be webbed by GSPC in above mentioned phases.

A Telecommunication and ICT Master Plan for the entire SIR area will be prepared separately. This will include provision of the passive infrastructure like Optical Fibre Network and Mobile communication towers along with the required Control Facilities. The ICT Master Plan will include the use of Information technology for Public safety and security services, Education Services, Transportation services, Health care and Municipal services.

CHAPTER 4

IMPLEMENTATION STRATEGY

4. Implementation Strategy

4.1. Comprehensive guidelines for implementing the DP

Land is the key component of urban development and the formulation of an effective and equitable land procurement strategy is critical to the successful implementation of the Draft Development plan. There are, very broadly, two approaches to land procurement; one through compulsory purchase with compensation under the Land Acquisition Act, 1894 and the other through Town Planning Schemes under the Gujarat Town Planning and Urban Development (GTPUD) Act, 1976.

4.1.1. Town Planning Schemes

The Government of Gujarat is preparing a Town Planning Schemes as per the Gujarat Town Planning & Urban Development Act, 1976. Under this model, the development authority brings together a group of landowners for the purpose of planning and a Town Planning Scheme for the area is prepared, laying out the roads and plots for public and social amenities. The remaining land is reconstituted into final plots for the original owners, with the size of the final plot in proportion to the size of the original plot, and its location as close as possible to the original plot.

A town planning scheme under the provision of GTPUD Act, 1976 may be made in respect of any land which is –

1. In the course of development
2. Likely to be used for development of residential, commercial, industrial etc.
3. Already built upon

Town Planning Scheme provides legislative support and finance for implementation. The fundamental objective of the readjustment technique is to make land available for development at least cost to development authorities and improve the environment effectively.

Town Planning Scheme is used to make a group of land holding in a planned manner. This is essentially achieved by providing each unit with a public road access and regularizing the shape of each plot. Compensation is paid to land owner of the land taken away for roads and public facilities. At the same time, betterment charges known as incremental contribution are collected from each owner to the maximum of 50 percent of the estimated increase in the land value after plot reconstitution. The funds so generated are utilized for the development of infrastructure and common facilities within the scheme area.

The local planning agencies would be able to attain the dual objective of controlling haphazard growth as well as the timely provision of physical infrastructure such as roads, sewers, water supply etc. and social infrastructure like schools, hospitals, parks, open spaces etc., and social infrastructure burden. Because of its self financing nature, Town Planning Schemes are also implemented in areas already developed, but with lack of adequate infrastructure.

The increase in the land value resulting from the development accrues to the original owner whenever the land is sold and developed for urban use. The advantages of this method from the development agency's point of view is that it does not have to acquire any land or bear the cost of infrastructure provision in the long term.

Pooling models similar to the Gujarat Town Planning Scheme have been used in other countries, notably Australia and Korea. Major benefits of this model are

- It is a proven model in Gujarat
- All the urban centres in the state are developed by this model
- Minimum investment is required for development with this model
- It is a win-win situation for both owners and administration
- Land owners get maximum benefit in this model
- Minimum litigations have been received in this model, in a span of 90 years since its first implementation in the state
- The model has a provision for development of physical as well as social infrastructure
- Land owners will receive a finished land parcel with all physical and social infrastructure over a period of time
- It is a democratic approach for development of land

4.1.2. The Role of the Regional Development Authority

MBSIRDA will be responsible for the land management process. Specialist departments will be established within the MBSIR to prepare Town Planning Schemes for the development of the MBSIR according to the Draft Development plan. There have been a number of large urban development schemes undertaken elsewhere in India over recent decades and a vast store of experience and expertise has been built up. MBSIRDA will call upon this body of knowledge and pool of talent in putting together their team to implement the MBSIR project.

4.1.3. Public Consultation and Participation

A participatory approach to development is proposed to ensure that land development in the MBSIR proceeds smoothly and is equitable to all sections of the community. Village Panchayats, land owners and land-less labourers all need to be consulted and involved in the process of development through participatory forums. Experienced and reputable development organizations and NGOs should be invited to advise and facilitate the land procurement process.

Public consultation needs to be commenced at the earliest opportunity in order to inform the population of the MBSIR of the Draft Development plan and the process of urban development. They should be informed on how they can be involved in decision making and their rights as land owners, residents and agricultural workers.

MBSIRDA will prepare a phased land development programme. A committee comprising members of MBSIRDA, State bodies such as land revenue department, infrastructure companies and village panchayats representatives will be formed to oversee the land management process. The precise make up of this committee and its rules and regulations will be determined by the Government of Gujarat in consultation with project stakeholders, including industrial bodies and land owners.

4.2. Provision of various facilities in Development Plan through TP Schemes

4.2.1. Provision of Community Facilities

Provision of land for educational and amenities through TP Scheme mechanism should be as per the stated norm of UDPI for the required planned population of sector and neighborhood level.

In order to meet the demand for the projected population of 9.12 lakhs residing in MBSIR an extensive range of community facilities are developed. MBSIR will largely be self contained in terms of health, education, cultural, Government, sports and open space facilities. It will also support the existing village settlements with the needed social infrastructure. The proposed land demand for community facilities within the MBSIR as indicated in Table below

Facility	Total Area Requirement (Ha)
Education	491
Health care facilities	72
Socio cultural centre	14
Other services	18

Table 4-1, Requirement of community facility for MBSIR

The provision norms are summarized in table given below,

Facility	One Unit / Population (as per UDPFI)	Area Requirement per unit (Ha.)	Requirement of Facility (Number)
Pre Primary / Nursery School	2500	0.08	365
Primary School	2500	0.4	365
Senior Secondary School	7500	1.6	122
Integrated School without Hostel Facilities	100000	3.5	9
Integrated School with Hostel Facilities	100000	3.9	9
School for Handicapped	45000	0.5	20
College	125000	4	7
Technical Education Institutions (considering industrial oriented city)	250000	4	4
TOTAL			
General Hospital	250000	6	4
Intermediate Hospital (Category A)	100000	3.7	9
Intermediate Hospital (Category B)	1000000	1	1
Polyclinic	100000	0.3	9
Nursing Home	50000	0.3	18
Dispensary	15000	0.12	61
TOTAL			
Socio Cultural Centre	1000000	15	1
Park / Garden etc.	1	0.0012	
Police Station, Jail, Police line etc.	100000	1.5	9
Fire Station	200000	1	5

Table 4-2, Standards for Community Facility

Source: UDPFI Norms

4.2.2. Provision of Open spaces

The provision of sector and neighbourhood level parks and open spaces is to be taken care of through Town Planning Scheme mechanism.

4.2.3. Developing public squares

In order to generate vibrant public realm in the city, it is recommended that the provision of amenities, commercial and education facilities to be located near the junctions of 30m and 45m ROW arterial road or major arterial nodes as public places in TP Scheme. It is also planned to develop and generate the public service plots accommodating Bus stand, auto rickshaw and IPT at every 500m along the public transit routes on main arterial roads.

4.2.4. Provision of Commercial

Provision of commercial retail and office facilities at sector and neighbourhood level in residential, mixed use and knowledge & IT within MBSIR should be through TP Scheme mechanism. The provision norms are summarized in table below, which indicates the various scales, intensity and type of commercial required based on the population and sector size

Facility	One Unit / Population (as per UDPFI)	Area Requirement per unit (Ha.)
Cluster centre	1000	0.022
Sector centre	1000	0.03
Community centre	1000	0.05
District centre	1000	0.088

Table 4-3, Requirement of commercial facility for MBSIR

Source: UDPFI Norms

4.2.5. Provision of pedestrian and bicycle routes and public transit system

1. It is proposed that the provision of adequate pedestrian, bicycle routes to be accommodated on major arterials and sub arterials with road width above 15 m ROW in TP scheme.
2. Provision of non-vehicular access accommodating pedestrian and bicycle routes within the green buffer space along the natural drains and canals in TP Scheme thus generating accessible green network across the SIR.
3. It is proposed to provide service roads in the industrial area for all roads above 30m in TP Scheme.
4. It is proposed that the FAR norms and permissible uses along the proposed new roads and service roads in the TP Scheme should adhere to the development control regulations provided in the DP.
5. Public Transit system in form of BRTS and Metro will be introduced as traffic demand increases. Necessary provisions have been made in the plan in terms of road widths and sector sizes for the same.

CHAPTER 5

BROAD COST ESTIMATES

5. Broad Cost Estimates

Various infrastructure components like road, rail, water supply, sewage etc. have been proposed within and outside proposed SIR. Schedule of rates (SORs) of GWSSB 2011-12 and R & B 2012-13 have been followed to estimate cost of proposed infrastructure components. Overall cost of estimates are divided in two major categories

- External infrastructure components
- Internal infrastructure components

5.1. External Infrastructure components

5.1.1. External Road Infrastructure

Sr. No.	Description	Proposed Length (Km.)	Service Lanes (Nos.)	Block Cost (Crores)
1.	SH-133 & SH-41 (Detroj to Adalaj via Kadi and Kalol)	49.70	6 (min.)	331.00
2.	MDR (Becharaji to Mehsana)	31.00	6	206.46
3.	SH-7 (Vithalapur to Viramgam)	27.00	4	43.20
4.	SH-135 (Kadi to Sanand via Thol)	37.30	4	59.68
5.	SH-55 (Becharaji to Radhanpur for direct connectivity to Mundra via Harij)	74.10	4	118.56
6.	Proposed 90Mt. road for connectivity Sitapur to Ughroj	11.27		39.00
	Total	230.37		797.90

Table 5-1, External Road Infrastructure

5.1.2. External Rail Infrastructure

Sr. No.	Description	Rail Length (Km.)	Block Cost (Rs. Crores)
1.	Becharaji- Katosan Gauge Conversion	24.70	247.00

Table 5-2, External Rail Infrastructure

5.1.3. Comprehensive - External Infrastructure

Sr. No.	Description	Block Cost (Rs. Crores)
1	Proposed External Road Infrastructure	797.90
2	Proposed External railway Infrastructure	247.00
3	Water Supply	18.00
	Total Cost	1062.90

Table 5-3, Comprehensive - External Infrastructure

5.2. Internal Infrastructure components

5.2.1. Internal Road Infrastructure

Sr. No.	Road Width (R.O.W) in Mt.	Total Length (km)	Total Cost of Roads (Rs Cr)	Total Cost of ROB /Waterway Bridges/ Flyover (Rs Cr)	Total Cost (Rs Cr)
1	90	15	141	760	901
2	60	24	120	60	180
3	45	43	216	120	336
5	30	88	381	280	661
	Total	170	858	1220	2078

Table 5-4, Internal Road Infrastructure

5.2.2. Internal Rail Infrastructure

Sr. No.	Description	Length (km)	Cost (Rs Crores)
1	Railway Line 1- North	8.3	83
2	Railway Line 2 – South	13.6	136
	Total	21.9	219

Table 5-5, Internal Rail Infrastructure

5.2.3. Water Supply

SR. NO.	COMPONENT	CAPACITY	COST (RS. IN LACS)
1	Head Work at Narmada Main Canal		Rs. 200 lacs
2	Water Treatment Plant	161 mld	Rs. 4830 lacs
3	Clear Water Pumping Station	161 mld	Rs. 878 lacs
4	Clear Water Trunk Main From WTP at Narmada Canal To Boundary Of Each Phase (MS Pipe)	1600 mm dia (161 mld capacity) (L-22KM)	Rs. 8313 lacs
5	Clear Water Trunk Main To Various WDS		Rs. 10047 lacs
6	Water Distribution Stations	27 NOS.	Rs. 2970 lacs
7	Water Distribution Network (DI K-7)	170 Km	Rs. 4522 lacs
	Total		Rs. 31760 lacs
			Rs. 317.60 Crore

Table 5-6, Water Supply

5.2.4. Sewage System

NO.	COMPONENT	CAPACITY	COST (RS. IN LACS)
	Sewage collection network		Rs. 4898 lacs
2	Sewage pumping station	17 Nos.	Rs. 4204 lacs
3	Rising main upto STP	93 KM	Rs. 15142 lacs
4	Sewage treatment plant		
	STP-1	50 MLD (1 Module)	Rs. 7000 lacs
	STP-2	50 MLD (1 Module)	Rs. 7000 lacs
	Total		Rs. 38244 lacs
			Rs. 382.44 Crore

Table 5-7, Sewage System

5.2.5. Water Recycling

SR. NO.	COMPONENT	CAPACITY	COST (RS. IN LACS)
1	Recycle water pumping station		
	At STP-1	41 mld	Rs. 221 lacs
	At STP-2	47 mld	Rs. 260 lacs
2	Recycle water trunk main from recycle water pumping station to various WDS (DI K-9 pipe)	55.3 Km	Rs. 6077 lacs
3	Recycle water distribution stations	17 NOS.	Rs. 1608 lacs
4	Recycle water distribution network (DI K-7)	170 KM	Rs. 3971 lacs
	Total		Rs. 12137 lacs
			Rs. 121.37 Crore

Table 5-8, Water Recycling

5.2.6. Storm Water Disposal System

Component	Storm Water Network		
	No. of outlets	Length (km)	Cost (Crores)
Storm water disposal network	44	170	222.73

Table 5-9, Storm Water Disposal System

5.2.7. Solid Waste Collection

Domestic waste (Rs. Crores)	Industrial waste (Rs. Crores)	Total
Rs. 55.14 Cr	Rs. 13 Cr	Rs. 68.14 Cr.

Table 5-10, Solid Waste

5.2.8. Comprehensive - Internal Infrastructure

Sr. No.	Description	Total Cost(Cr)
1	Roads and Bridges	2078
2	Rail	219
3	Water	317.60
4	Sewerage	382.44
5	Water Recycling	121.37
6	Storm Water	222.73
7	Solid Waste	68.14
8	Power (as per Concept Report)	660
Total		4069.28

Table 5-11, Internal Infrastructure Costing

5.3. Comprehensive Infrastructure

Sr. No.	Component	Cost (Crores)
1	External Infrastructure	1063
2	Internal Infrastructure	4069
Total		5132

Table 5-12, Comprehensive Infrastructure Costing